Harvard Medical

ALUMNI BULLETIN SUMMER 1993

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AMERICAN MEDICAL WRITERS ASSOCIATION

Summer 1993
Volume 67 Number 1

Harvard Medical
ALUMNI BULLETIN

1992 Democratic National Convention.
AP/Wide World Photos

Inside HMAB

Harvard Medical
ALUMNI BULLETIN

This issue of the *Bulletin* is a miscellany. David Bell '77, chief of the HIV Infections Branch of the Hospital Infection Program of the CDC, leads off with a lively account of his experiences identifying the risks of HIV infection to and from health workers. Assistant Editor Terri Rutter adds an appropriate sidebar on the problems facing some 7,000 seropositive health-care workers.

Then follows our cover story, the highlights of an HMS/Kennedy School forum co-sponsored by Dean Tosteson '48 and moderated by Marvin Kalb, entitled Presidential Health, Press and Politics. The latest presidential election is a forceful illustration that it is no easy matter to balance the individual's right to privacy and the public's need to know.

We turn next to Pete Ehrens '41, professor of medicine, *emeritus* at Rockefeller University, who warns of diminishing support and danger facing basic patient-oriented research—clinical studies in patients of the mechanisms of human disease, research that our Fuller Albright, Soma Weiss, and William B. Castle did so well.

Furthering the cause of research, Patricia K. Donahoe, chief of pediatric surgery at the MGH and first Bartlett Professor of Surgery, argues that for the majority of those privileged to attend Harvard Medical School, research is an obligation not an option.

We leave the academic grove to travel with Daniel Feikin '93 to Kenya, in his search for malaria in Somali refugee camps during the recent war; a short poem by Amy Lai '93; and finally an excursion to Kansas and another of George Bascom's '52 delightful stories from Deep Creek country in "Moonflower Wine."

I'd like to also thank Tim Guiney '66, who after 12 years is stepping down from our editorial board.

J. Gordon Scannell '40

The *Harvard Medical Alumni Bulletin* is published quarterly at 25 Shattuck Street, Boston, MA 02115

Telephone: (617) 432-1548. Third class postage paid at Burlington, Vermont. Postmaster, send form 3579 to 25 Shattuck Street, Boston, MA 02115, ISSN 0191-7757. Printed in the U.S.A.

Letters

Rural Doctoring

The Summer 1992 issue of the *Bulletin* contained a group of articles after the spirit of Albert Schweitzer. I was particularly interested in Patricia White's reference to her experiences in McClellanville, SC as an example of the "third world" in the United States.

Thirty-five years ago I brought my family to Georgetown, SC, where I joined a New York Bellvue Hospital-trained general surgeon. At a population of 10,000, this is about as small as a town can be to support a hospital.

Ten to fifteen years ago, when health planning was more aggressive, a number of rural health initiatives, such as St. James Santee in McClellanville, were established in an effort to restore convenient access to good care for people in remote areas. I was active in a Health Systems Agency for a number of years and for a time served as chairman. These remote centers continue to provide a needed service as Dr. White has so ably indicated. She invites the members of our profession to give of ourselves as we can to make life a little better for those like she has seen.

The problem of physician distribution has long been with us. I have pondered the question for years. A list of reasons explain physicians' reluctance to settle in the rural areas. I have concluded that a particular sort of person is required for this type of practice, and such an individual seems to have relatively low market-value in the medical school admission process; comparatively few are selected. A school's survival understandably must be linked to the attraction of students who will one day have real impact on the financially productive areas of the health care industry. The triad of research, teaching and clinical practice has been emphasized by medical school faculties. Only recently has there developed an interest in primary care.

Rural patients generally tend to be relatively poor and medically indigent. There is a morale problem for physicians who treat in this setting. There must be a large number of physicians scattered over the country who do their work quietly, almost unnoticed by the profession. Most do not write letters to the editor (this is my first!). Each must find a reason for doing what they do.

One must draw a distinction between those of us in private practice on the one hand and the staffs of government-supported centers, such as St. James Santee, on the other. Each has its own strengths and weaknesses. The rural clinic does a satisfactory job caring for its patients during the 9-to-5 day. Only the private practitioners cover the emergency rooms at night. The physicians staffing the health clinics usually don't stay long in these isolated areas. The result is that such educated persons and their families tend to have little impact on community improvement as a whole.

Possibly you are now ready for my declaration that "in my youth I gathered materials for a cathedral and in my old age built a woodshed." I could feel that way, but I don't. There is something about being a part of the lives of people in the low country of South Carolina that has more than fulfilled my professional expectations.

James W. Forrester '53

War Memories

You deserve the highest praise for the Spring '93 issue of the *Bulletin*. It brings back a swarm of memories. I was in the Sixth General Hospital—along with Ed Bland, Claude Welch and Marshall Bartlett—in Florida, Morocco and Rome.

War touches people in places remote from battle. I was a lad of seven when the town church bells and sirens exploded at 4:00 am in Flagstaff, Arizona on Armistice Day, November 11, 1918. WWII is about five wars back. My wife—who had been under considerable stress for 33 months all the time I was away in WWII—watched in untold anxiety as she twice saw a Marine Corps. officer walk up our sidewalk to give us news of our son in Vietnam. Each time we thought it was to announce his death. Once it was because he had been wounded, and again, when he was coming home, emaciated and wordless.

The most unwarlike of persons, I nevertheless thought that there is some virtue in consistency. So I stayed in the Army Reserve after WWII. One weekend evening I was drowsing through a training film on the use of nuclear weapons in artillery shells when someone tapped me on the shoulder and informed me that I was the new commander of our General Hospital at the Oakland army base. I commanded two other hospitals before reaching mandatory retirement age at 60.

One of my painful duties was to administer punishment to our chaplain, who was drunk in a hotel the entire two weeks of summer camp. He later came back to thank me, saying that prior to my regime people had always covered up for him, but that my treatment forced him back to reality. He gave up his parish and joined AA.

Albert B. Crum's article on Absolute Leaders illustrates the influence of testosterone on history. From Alexander to Saddam Hussein, all have also been Absolute Males. As I read the morning newspaper today I have no reason to believe that humankind will turn away from wars any time in the future.

Sedgwick Mead '38

Letters

Praise and Reflection

The Spring 1993 *Bulletin* you label as your "War and Peace" issue is a superb collections of articles. I could not help but read every single one. You seem to have picked out the pearls from the mass of literature covering the last half century.

I was impressed particularly with Jennifer Leaning's "New World Disorder." She poses many questions addressing our dilemma in dealing with the rights of the individual against the rights of the group. This is an issue within our own American society as much as it is between nation-states in the society of man on this planet—this world village.

I myself am disappointed that as the world has become a "village," albeit a huge one, the nation-states are asserting their sovereignty and independence. What's more, within their current boundaries, these entities are breaking up into even smaller, ethnic-oriented microcosms. Man has lost his faith in God.

Even here in Hawaii, the "Native Hawaiians"—of which there are fewer than 5,000 (out of 1.2 million people) who are "pure," full-blooded, because of intermarriage—are now trying to assert themselves and are demanding sovereignty, i.e. lands, compensation and political autonomy.

I once thought the society of man might reach an utopian "One World" under a parliament of nations with a world court and "world troopers" (police) who would enforce common law—modeled after the United States and its Constitution! Instead, it seems we are now headed toward self-destruction: each man for himself, each grouping for itself.

J. Bryan Hehir, in the concluding article "Is Force Justifiable?", is equally pessimistic.

Frederick Reppun '39

Pulse

The New Research Building Gets a Name

Harvard Medical School has received a $20 million gift—the largest single donation in HMS history—from the Warren Alpert Foundation for the school's new research building. To be named the Warren Alpert Building, the five-story facility, which opened last fall, houses laboratories of the departments of genetics, neurobiology, and pathology, and the Center for Blood Research.

In presenting the gift, Warren Alpert expressed his wish "to stimulate biomedical research and encourage scientific achievements that will alleviate human suffering from disease....It gives me enormous satisfaction to know that I am helping millions of people around the world who will benefit from the advances that will take place in the new building."

Born in Chelsea, Massachusetts, Alpert put himself through Boston University, where he graduated in 1942. He served in World War II, for which he was awarded the Purple Heart, and in 1947 he graduated from Harvard Business School. With practically no money, he then started his own business and today, Warren Equities, Inc. and Warren Companies —which market petroleum and food products—do $600 million a year in volume.

"Warren Alpert is a man ahead of his time," said Dean Daniel C. Tosteson '48 in acknowledging the gift. "He was one of the first friends of Harvard Medical School to recognize the value of our New Pathway in medical education. And today, with his splendid generosity, once again Warren Alpert is leading the way in providing a home for the next frontiers in biomedical research."

Alpert donated $500,000 to help launch the New Pathway curriculum, and six years ago, he established the Warren Alpert Foundation Prize in biomedical research, which is administered by HMS and presented annually to a scientist or team of scientists in the United States or abroad.

As Harvard President Neil Rudenstine commented at the dedication of the Warren Albert Building in May: "Many people give money away, but the most intelligent and enlightened people give money because they see something good."

Warren Alpert and Dean Daniel Tosteson

photo by Barbara Steiner

Carey Farquhar discusses her poster on "Influence of Reproductive Steroid Hormones on HIV Replication In Vitro."

photo by Barbara Steiner

Soma Weiss Day

Posters displaying a broad expanse of student research projects filled the MEC Atrium for the 53rd annual Soma Weiss Day in April. A record 73 students presented posters this year.

A committee of peers and faculty selected five students to give oral accounts of their work. David Altshuler (MD-PhD '94) described his evidence for three different factors regulating the development of retinal precursor cells into rod photoreceptors. Tamara Callahan '93 described her studies of the economic implications of multiple births and assisted reproductive technologies. Yung-Kang Chow (MD-PhD originally in the Class of '91) told of his in vitro tests of a new AIDS treatment strategy for overcoming drug resistance, and Samuel Moskovitz '94, of his identification of mutations that cause a family of heritable disorders collectively called mucopolysaccharidosis I. And Kari Nadeau (MD-PhD '95), who plans to specialize in transplantation surgery, depicted her investigation of how immunosuppressive drugs work on a molecular level.

Patricia Donahoe, Bartlett Professor of Surgery and chief of pediatric surgical services at MGH, delivered the keynote address to the assembly. The HMS graduate, "is privileged and thus proportionately more responsible to shepherd the future," she said in her talk entitled "Research: An Obligation, Not an Option." Donahoe encouraged students to develop an "I can do that!" attitude as a strategy towards solving difficult problems. [See page 34 for full text.]

Soma Weiss Day was named in honor of physician-researcher Soma Weiss (1892-1942) and was begun originally as an undergraduate assembly by students in 1940 to provide a forum for displaying their research to peers.

photo by Barbara Steiner

Pulse

Huntington's Genetic Flaw Discovered

It took 10 years to finally pinpoint it, but a team in the MGH laboratory of James F. Gusella, PhD—part of an international collaborative research group—has discovered the gene that causes Huntington's disease. Their results were reported in the March 26 issue of *Cell.*

"This finding needs to be confirmed before it can lead to diagnostic and prognostic tests for Huntington's disease, but this represents a major step," says Gusella, who is an HMS professor of genetics and director of the MGH Molecular Genetics Unit. "This was a very hard mystery to solve."

Huntington's is a progressive neurological disorder, which at onset—usually after age 35—causes involuntary movements, unsteady gait, slurred speech and mental deterioration, and leads to death within 10 to 20 years. Roughly 30,000 people in the United States have the disease and 150,000 more are members of Huntington's families, who each have a 50-50 chance of getting it. Although there is a genetic test for determining who has inherited the gene, there is no cure.

Gusella and colleagues first identified the area in which the gene was located—on the end of the short arm of chromosome 4—in 1983. They also found a genetic marker, which became the basis for the genetic test. Although this narrowed their search, they still had hundreds of thousands of base pairs—subsections of genes—to sift through, not knowing where one began and another ended.

In 1984 Gusella's team and five other groups—from MIT, California, Michigan, England and Wales—formed the Huntington's Disease Collaborative Research Group. More markers were found, but the hunt for the gene was replete with frustrating dead ends. "If the six teams who worked on this had been competing rather than cooperating, the search would have gone on a lot longer," says Gusella.

Finally, a team in Gusella's lab led by Marcy MacDonald, PhD, assistant professor of neurology, found a flaw in the newly discovered gene IT_{15} that apparently leads to Huntington's. Normally this gene contains 11 to 14 copies of a sequence that inserts the amino acid glutamine into the gene's protein product. But in Huntington's patients, the sequence is repeated 42 to 80 or more times.

It is not clear yet how the extra insertions lead to Huntington's, but it does appear that the more repetitions of the sequence, the earlier the onset of the disease. There are many other questions, such as, what is the normal role of the IT_{15} gene? Why is only the central nervous system affected when the protein product is found in all cells?

Finding treatment is a long way down the road, but as MacDonald says: "We've crossed a significant threshold."

From left: research fellows Mabel Duyao and Christine Ambrose, Marcy MacDonald and James Gusella.

photo by Barbara Steiner

photo by Barbara Steiner

David Ginty, Margaret Thompson and Michael Greenberg examine slides of the suprachiasmatic nucleus.

New Methods to Examine Molecules

Michael Greenberg, PhD and colleagues in his laboratory on the Quadrangle, have developed two new approaches for examining molecular events within brain cells. The first, an antibody-based assay, allows identification of the messenger proteins that relay external signals to the DNA of cells. The second allows researchers to determine the mechanism by which genes are activated by external signals.

"Researchers have been trying for some time to understand how neurotransmitters change the behavior of the cells they contact, and how those changes alter the behavior of the organism," says Greenberg, associate professor of microbiology and molecular genetics. The first of these approaches—described in one of two papers in the April 9 issue of *Science*—allowed the investigators to identify a protein that governs the day/night sleep cycle in the brain. The second gave them a look at how new information is processed within memory-associated neurons.

Greenberg and his colleagues have begun to address these questions using the new methods they devised. Ultimately, the use of these new approaches could lead to a greater understanding of the molecular basis of memory-deficit disorders and neurodegenerative diseases. Greenberg was recently awarded a grant from the HMS Funds for Discovery Program to continue these studies.

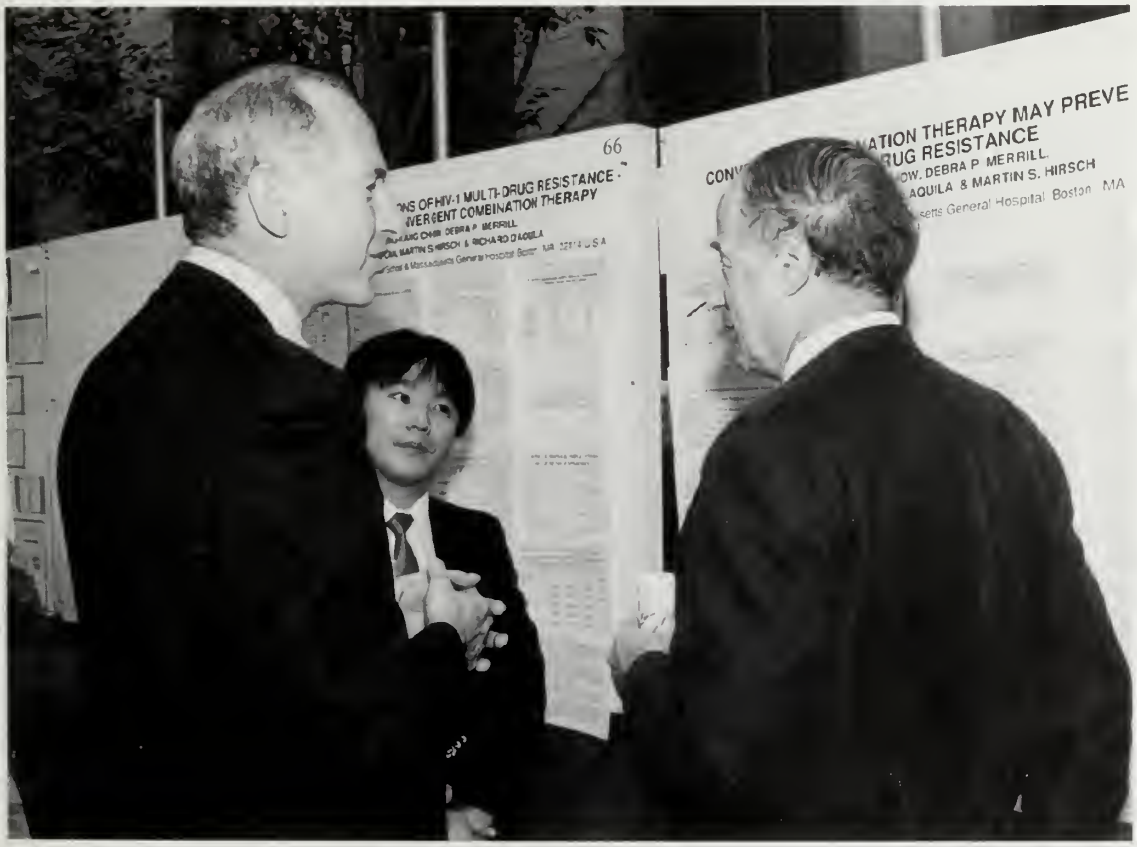


photo by Barbara Steiner

An HMS MD-PhD student, Yung-Kang Chow, was catapulted into the media limelight in February when in vitro results of a possible new approach to AIDS treatment were published in *Nature*. Working in the MGH laboratory of Martin Hirsch, MD (photo right), professor of medicine, Chow proposed a new twist to the traditional multiple-drug strategy against HIV. In cultured cells, he and colleagues showed that a three-drug combination targeted at the same HIV enzyme could stop replication of the virus and seemingly overwhelm the virus's ability to develop drug resistance. "Whether it will translate into a clinical success can only be demonstrated by the carefully controlled clinical trials that we will begin later this year," cautions Hirsch.

Pulse

photo by Barbara Steiner

Third-year student Rajesh Mangrulkar celebrates with Brian Labow, who matched to the MGH.

They Met Their Match

With a joyous whoop and one smooth jump, Grant Colfax cleared the steps leading from the registrar's office into the arms of his friend Daphne Miller, who greeted him with equal excitement. The two had just opened their match day envelopes and each got their first choice: Miller to Natividad Medical Center in California and Colfax to the University of California, San Francisco.

A chorus of excited shouts of "Where are you going? Where are you going?" filled the second floor landing of Building A as twins Eliza and Joan Lo nervously opened their envelopes. They will both be happily on their way to Brigham and Women's Hospital.

"The results are wonderful," says Edward Hundert '84, associate dean for student affairs, of Match Day '93 in which everyone matched. "It's a thrill to be able to help such talented individuals in their continuing career development."

Students and their matches are as follows:

ANAESTHESIA

Josephine Hernandez
SUNY Health Science, Syracuse, NY

Dean Martin
Massachusetts General Hospital

Phuong Minh Nguyen
Johns Hopkins Hospital

Gayla Sylvain
Emory Univ. School of Medicine, GA

EMERGENCY MEDICINE

David Tancredi
University of Cincinnati Hospital, OH

FAMILY PRACTICE

Daphne Miller
Natividad Medical Center, CA

Sharon Hausman-Cohen
Brackenridge Hospital-Austin, TX

MEDICINE

Pietro Andres
Beth Israel Hospital, Boston

Erik Carson
Stanford University Hospital, CA

Grant Colfax
University of California, San Francisco

Amy Colson
Beth Israel Hospital, Boston

Christopher Crenner
Brigham and Women's, Boston

Elia Duh
Duke University Medical Center, NC

Daniel Feikin
University of California, San Francisco

Kathryn Glatter
Beth Israel Hospital, Boston

Steven Gordon
Massachusetts General Hospital

Anne Guenzel
New England Deaconess, Boston

Samuel Hahn
Massachusetts General Hospital

Michael Hirt
UCLA Medical Center, CA

Chi-Yuan Hsu
Beth Israel Hospital, Boston

Philip Huang
Massachusetts General Hospital

Stefan Kertesz
Beth Israel Hospital, Boston

Yeong Kwak
University of California, San Francisco

John Lepore
Massachusetts General Hospital

Eliza Lo
Brigham and Women's, Boston

Joan Lo
Brigham and Women's, Boston

Laura Miller
University of California, San Francisco

Pratik Multani
Massachusetts General Hospital

Louise Rambo
Brigham and Women's, Boston

Michael Rudolph
Rhode Island Hospital

Peter Rosenberg
Massachusetts General Hospital

Thomas Schuetz
Massachusetts General Hospital

Adam Schussheim
New York Hospital

Lucy Song
Presbyterian Hospital, NY

Kristina Utzschneider
University of Washington Affiliates, Seattle

Robert Vonderheide
Massachusetts General Hospital

NEUROLOGY

Lawrence Bluth
Harvard-Longwood PG, Boston

Andrew Budson
Harvard-Longwood PG, Boston

Steven Frucht
New York Hospital

Heidi Roth
Harvard-Longwood PG, Boston

NEUROSURGERY

Peter Li
New York Hospital

Laurence Rhines
Johns Hopkins Hospital, Baltimore

Charles Rich
Columbia University, NY

Theodore Schwartz
Columbia University, NY

Nathan Selden
University of Michigan Hospital, Ann Arbor

OB/GYN

Diana Currie
Cedars-Sinai Medical Center, Los Angeles

Siobhan Dolan
New York Hospital

Gretchen Fisher
University Health Center, Pittsburgh

Julia Gathe
University of California, San Francisco

Natalie Gelernter
North Shore University Hospital, NY

William Grobman
McGaw Medical Center, Northwestern University

Elizabeth Howell
New York Hospital

Maria Lockhart
St. Luke's Hospital, Roosevelt, NY

Marg Eva Morris
University of Washington Affiliated, Seattle

Abraham Morse
Johns Hopkins Hospital, Baltimore

photo by Barbara Steiner

Michael Ming shows his results to third-year student Renee Strucke.

OPHTHALMOLOGY

Jocelyn DelCarmen
University of California, San Francisco

Heidi Fischer
Washington University, St. Louis

David Huang
University of Southern California, Los Angeles

Scott Hyver
California Pacific Medical Center, San Francisco

Altorous Keaton
University of Texas SW, Dallas

David Stidham
University of Texas SW, Dallas

Yaffa Weaver
Univeristy of Miami, FL

Michael Yang
University of Southern California, Los Angeles

ORAL SURGERY

Patrick Kline
Massachusetts General Hospital

Timothy Mitchell
Massachusetts General Hospital

Kris Uyehara
Massachusetts General Hospital

ORTHOPEDIC SURGERY

Sigurd Berven
Harvard Combination Ortho PG, Boston

Christopher Chiodo
Harvard Combination Ortho PG, Boston

Michael Diminick
Hospital of Special Surgery, NY

Damien Doute
Johns Hopkins Hospital, Baltimore

Valerae Lewis
Harvard Combination Ortho PG, Boston

Paul Winterton
Mayo Graduate School of Medicine, MN

Gregory Guyton
University of Iowa Hospitals/Clinics, Iowa City

Hoang Tran
University of California, San Diego Medical Center

OTOLARYNGOLOGY

Joseph Califano
Johns Hopkins Hospital, Baltimore

Joshua Helman
Duke University Medical Center, NC

Keiko Hirose
University of Washington, Seattle

Amy Lai
Massachusetts Eye and Ear Infirmary

Sumeet Mathur
Duke University Medical Center, NC

Evan Reiter
Massachusetts Eye and Ear Infirmary

Jesse Salmeron
Mt. Sinai Hospital, NY

Justin Wu
Duke University Medical Center, NC

PATHOLOGY

Kamran Badizadegan
Brigham and Women's, Boston

William Faquin
Brigham and Women's, Boston

Mark Fleming
Brigham and Women's, Boston

Matthew Meyerson
Massachusetts General Hospital

PEDIATRICS

Deborah Buccino
Children's Hospital, Boston

Bradford Curtis
Univeristy of California, Irvine Medical Center

Kay Fang
Children's Hospital, Boston

John Girard
University of Washington Affiliates, Seattle

Elena Goldberg
Children's Hospital, Philadelphia

Caleb King
Children's Hospital, Boston

Ching Lau
Baylor College of Medicine, Houston

David Magilner
Albert Einstein Medical School, Philadelphia

Gregory Priebe
Children's Hospital, Boston

William Pu
Children's Hospital, Boston

Terence Sanger
LAC-USC Medical Center, CA

Terri Schmidt
Children's Hospital, Boston

Joyce Soprano
Children's Hospital, Boston

Michelle Weinberg
Children's Hospital, Boston

PLASTIC SURGERY

Karen Hedges
University of Michigan Hospital, Ann Arbor, MI

PRELIMINARY MEDICINE

Andrea Cheville
New England Deaconess, Boston

David Goodman
University of California, San Francisco

Julia Haimowitz
Hospital of University of Pennsylvania, Philadelphia

Mary Hartsuck
Brigham and Women's, Boston

Stamatina Kaptain
Hospital of University of Pennsylvania, Philadelphia

Christopher Leffler
Bureau of Medicine & Surgery, U.S. Navy Program

Michael Ming
Massachusetts General Hospital

Jessica Wu
Mt. Auburn Hospital, Cambridge, MA

PRELIMINARY SURGERY

Michael McCue
Massachusetts General Hospital

Joel Stewart
Portsmouth Naval Hospital, VA

PSYCHIATRY

Karen Dusseault
McLean Hospital, Belmont, MA

RADIATION

Ajay Dubey
Joint Center for Radiation, MA

RADIOLOGY

Joel Fletcher
University of Iowa Hospitals/Clinics, Iowa City

Jessica Leung
University of California, San Francisco

Hasan Naqvi
University of California, San Francisco

Lynne Pinkney
New York Hospital, NY

Eugene Tsai
Massachusetts General Hospital

Albert Tu
Lahey Clinic Medical Center, MA

George Wu
Brigham and Women's, Boston

Samuel Wu
Hospital of University of Pennsylvania, Philadelphia

Pulse

SURGERY

Arthur Coday
Johns Hopkins Hospital, Baltimore

Sanjoy Dutta
University of California, San Francisco

Harold Fernandez
NYU Medical Center, NY

Samuel Finlayson
Massachusetts General Hospital

Charles Friel
New England Deaconess, Boston

Melissa Gilliam
University of Chicago Hospital, IL

Zachary Gleit
Presbyterian Hospital, NY

Allan Goldstein
Massachusetts General Hospital

Pedro Huertas
Brigham and Women's, Boston

Brian Labow
Massachusetts General Hospital

Elaine Tseng
Johns Hopkins Hospital, Baltimore

UROLOGY

Oneeka Williams
Lahey Clinic Medical Center, MA

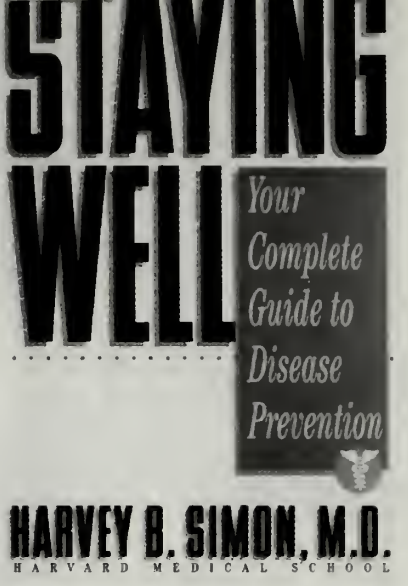
OTHER

Chantal Caviness
Master's in Public Health
University of Sydney, Australia

Sara McCarthy
Sabbatical

Christopher Wright
Neuroscience Research
Groenewegan Lab, Amsterdam

Book Mark



STAYING WELL: YOUR COMPLETE GUIDE TO DISEASE PREVENTION
by Harvey B. Simon
(Houghton Mifflin, 1992)

by Alfred Sommer

The premise of *Staying Well* by Harvey Simon '67 is that everyone can and should take control of their lives and their health; prevention is worth a good deal more than a pound of cure; and we'll feel better for it (the "virtue factor"). It worked for Harvey and it can work for you! If you forget and forgive the hype (I recommend both), Simon's new book is a fascinating exploration of health, disease and prevention.

There is no arguing the premise that societal wealth and societal health often bear little relation to one another. The sharp rise in life expectancy (and comparable decline in infant mortality) associated with increasing per capita GNP plateaus at $1,000-$2,000. Some of the poorest countries have longer life expectancy than richer ones. Part is explained by how much is spent on health; even more on how it is spent. But the great gains in health worldwide relate to changing behavior.

The Japanese now have the lowest infant mortality rate in the world; in 1930, it was higher than in any present Third World country. This change is largely attributed to the introduction of the "mother's child-care handbook" as part of a program to improve prenatal and neonatal care. Tuberculosis rates in the United States plummeted long before the advent of anti-tuberculosis agents; measles mortality declined before the development of an effective vaccine.

Can behavioral change make a difference in the United States today, particularly among the better educated, health-seeking population likely to read *Staying Well?* The answer is undoubtedly yes, but the impact will be most apparent among high risk individuals: those who are obese (if they avoid the yo-yo dieting effect), hypertensive, diabetic, prone to coronary artery disease or other familial disorders (genes do count), and those who engage in unsafe sex or substance abuse (alcohol and tobacco).

Had Simon confined himself to high risk groups and behavior, it would have been easy to locate his tome in the bookstore: "self-help (medical)." Unfortunately it prescribes "preventive" behavior and remedies for everyone. While his recommended draconian reduction in salt intake would no doubt benefit salt-responsive hypertensives, as a salt lover with a lower BP than Simon, I'm unconvinced by the text. At times the book is powerful and persuasive—each of his "10 commandments" to a healthier life are shown to impact on a variety of important ailments. At other times, it limps. The discussion of coronary artery disease (Chapter 2) really pumps along (puns like this run through the text) from primary through "tertiary prevention"; but the chapter ends with a desultory discussion of rheumatic heart disease. Rheumatic heart disease? Simon acknowledges the condition is increasingly rare, the inciting infection often

asymptomatic, and that he often treats without first obtaining a strep test. His advice to the now concerned reader: don't run to the doctor with every sore throat! What's the poor reader to do?

Lead poisoning is described in a chapter entitled "Stroke and Other Neurological Diseases." The advice: "Getting the lead out (sic) should be a top priority for American society." A great turn of phrase, but not much help.

Despite disclaiming any interest in writing an encyclopedia or medical textbook, Simon has done that, even following the familiar chapter-by-chapter review of systems. It's true the book attempts to include "only" ailments that are preventable, but as seen above, it tends to drag the definition far afield. Some of these excursions are positively brilliant: the pros and cons of hormone replacement for menopause are discussed with great understanding and sensitivity. This chapter bears wide dissemination in its own right, but places the book in a different part of the store: "general knowledge (medical)."

Simon is an admitted convert—and like all converts, he proselytizes. It is not enough to use the Metropolitan Life Insurance tables, you must calculate your Body Mass Index (he uses himself as a real-life example). Don't accept the serum lipid profile as provided by the laboratory of "Man's Greatest Hospital"—you need to calculate your own cholesterol ratio. Forget the fat intake guidelines of the American Heart Association (30 percent); at a minimum get down to 20 percent. And of course, aerobic exercise—at least 3 hours per week, but preferably more (Harvey runs 12 miles a day!). Is all this consistent with reducing stress? See Chapter 19, "Psychological Health."

Let's assume one follows his advice. Will you live longer? Is it worth it? Here I confess to a healthy dollop of rationalization. Simon points out that totaling a few "simple" things like reducing fat and salt intake and regular exercise reduces the risk of coronary artery disease 85 percent!" Simply adding these (presumably relative risks) reminds me of the 1973 oil crisis. The "percentage fuel saving" attributable to radial tires, more efficient engines, lower speed limits and various additives often exceeded 100 percent, prompting one wag to suggest you stop every 50 miles to bail out your overflowing fuel tank!

What about good old attributable risk? This, after all, is the crux of the issue. We learn that you will prolong your life, on average, by the amount of time you exercise. If you religiously perform aerobic exercises three hours every week from the time you are 35, you add one year to your life span. This suggests (to a less than enthusiastic athlete like myself) that if you love aerobic exercise, the deal you're being offered is great: have fun exercising and gain an "extra" year of life in the process. But if you hate to exercise, it's decidedly a bad deal: potentially trading a year of (relative) youth for an extra year at the geriatric margin. The bard might have said, "Youth is wasted...exercising."

Back to the critical issues: what is the book about and who is it for? It is a lively, interesting and informative guide about health and disease, which deserves to be read cover to cover, as much by the practicing clinician as by the lay public—the former because it contains a horde of neatly summarized "pearls" most of us forgot, or never learned.

Will this book actually change people's behavior? Probably not, at least not until they undergo an epiphany similar to Simon's. On the other hand, I read *Staying Well* while flying back from a WHO meeting in Geneva. I never miss the opportunity for real raclette and fondue when in Switzerland—and I didn't this time either. But the airline cheese platter arrived at page 389 ("Nutritional Health")—and I skipped the cheese. Did I already know better? Presumably, since I sit on the IOM's Food and Nutrition Board. Will I never have raclette again? I doubt it. But I must admit, Harvey does seem to have lost less hair than I have in the 26 years since we graduated from HMS.

This book may not change your lifestyle, but it will prepare you to better counsel your patients and to answer those pesky questions asked by those who read too much.

Alfred Sommer '67 is dean of the School of Hygiene and Public Health at Johns Hopkins University.

On the Quadrangle

Division of Medical Sciences

Graduate students are an increasing presence on the medical school's campus these days. Though certainly not visually distinguishable from the medical students, the graduate students represent more than one-third of all students—and they're here year round.

The number of doctoral candidates in the Division of Medical Sciences (DMS) has grown steadily since the mid-1980s, when there were roughly 280 students, to about 450, a number that may soon approach 500. dms is a cooperative program of the medical school and the Graduate School of Arts and Sciences, and was started around 1909. Currently, graduate students pursue studies in one of five programs: cell and developmental biology; immunology; neuroscience; virology; and a tri-department program offered by the departments of genetics, biological chemistry and molecular pharmacology, and microbiology and molecular genetics. This fall a sixth program—biological sciences in public health, a cooperative program with the Harvard School of Public Health—joins dms, and to keep pace with changes in the basic sciences at HMS other innovations in the program are expected in the coming year.

The impetus for growth in the DMS came from the preclinical department heads and from recommendations of a visiting committee of the university's Board of Overseers. "Although some of the growth and enthusiasm have resulted from the very rapid advances in molecular and cell biology," points out Tom Fox, PhD, vice chairman of dms and associate professor of neuroscience. (R. John Collier, PhD, Preslely Professor of Microbiology and Molecular Genetics, is chairman.)

"There was a feeling among the visiting committee and department chairs at HMS that many of the faculty doing research had the desire and the facilities to train more students, particularly in the areas of biomedical research that have expanded," says Fox, who adds that it is important from the faculty standpoint to have a vigorous graduate program. Hand in hand with strong research programs are strong training programs. "Students provide extraordinary enthusiasm and energy."

There are currently several ways for students to co-mingle scientific training with clinical training. Many md students spend a month, a summer or a year in a research laboratory. Medical students may apply to the MD/PhD program and then take dms, MIT or Harvard University graduate courses. Health Sciences and Technology (HST) students—who share clinical but not pre-clinical years with the other md students—may also go for a MS or a PhD. And about 12 percent of DMS students are also pursuing a medical degree through the md/PhD program.

Plus, as of this year, the Harvard-Markey Biomedical Scientist Program is enabling 12 to 16 DMS students to take an extra year of courses, many with medical students, to enrich their experience and perspective on the interplay of research and medicine. The goal of the Markey program is for graduates to "achieve sufficient understanding of the language and concepts of human disease to permit graduates to read widely, to think creatively, and to interact with physician-scientist easily and productively in the development of the clinical implications of their basic scientific research."

The best mix of cross-disciplinary training is a hotly debated issue in biomedical science circles. But far from taking sides, Fox contends that "biomedical research has benefited greatly from the mixture of people trained in science and medical programs." Inroads made in molecular biology illustrate the value of people with different backgrounds working together, he says. "I think it is important that HMS has a great deal of flexibility and options for medical and graduate studies."

Fox believes that an active understanding of research is now essential for physicians. "One hopes that the more they are integrated, the more medical students who become physicians will benefit from scientists who are their peers."

Ellen Barlow

Community Minded

The New Pathway leaves some room for unstructured time, so many first- and second-year students take advantage of their freedom by getting involved in extra-curricular activities with nearby communities.

Urban Health Project, the grandparent of community health student organizations, has for eight years been sending HMS students into Roxbury and Dorchester, where many residents have limited or no access to health care. Anywhere from eight to thirteen students work full time during the summer at various clinics and other health-care facilities, and then the rest of the year they raise money and educate others about the health needs of urban populations (UHP also develops the program for the urban health component of Patient/Doctor).

Last summer, for example, UHP member Deborah Cohan '95 provided HIV information and pre- and post-test counseling at Dimock Community Health Center in Roxbury. And, as a member of a multidisciplinary team at Trinity Hospice of Greater Boston, Inc., Jack West '95 made daily home visits to hospice patients.

Outside of the more formalized

UHP, however, students are finding ways to address other needs in local communities, beyond the medical clinic.

"Organizations such as these give a more human side to medicine," says Stephen K. Frankel '95, student council chair. "They help students remember why we're here."

Frankel says that roughly 50 student organizations are currently active, and about a half-dozen of them focus exclusively on community-oriented projects.

"It gets us out of the textbook and into real life," says Liz Twardon '95 of her involvement with HOPE, the acronym for Health Outreach Prevention and Education. HOPE is an umbrella for groups of students working with communities of homeless, indigent peoples and those who have no access to health care.

One of HOPE's activities has been to work with Jim O'Connell '82, longtime advocate and physician for Boston's homeless, to organize a program for medical student volunteers at O'Connell's clinic for the homeless at Boston City Hospital. Other projects have included conducting TB screenings and offering information about vaccinations in Roxbury; working through Dimock Community Health Center with children and families who have AIDS; and educating about lead poisoning.

Providing support and friendship for children with cancer is the goal of Cancer Outreach. Based on the Big Brother/Big Sister program, Cancer Outreach matches an HMS student with a patient from the Dana Farber Cancer Institute, aged 6 to 17 years old. Siblings of young cancer patients also participate in the program, to both understand what is happening to their brothers or sisters, and also to get the companionship they might be missing due to the attention the other is receiving.

"Many of these kids come from poor families, so they don't have access to a lot of the activities we do with them," says Beth Levine '95, whose "little sister" Lynn is 14 years old. But, with bowling, spring picnics and trips to the zoo, it's not just the children who enjoy themselves. "I get to do kid things, too," she says. "And that's fun."

Levine says she was drawn to Cancer Outreach not just because she enjoys working with children, but also because she had cancer herself when she was a teen. During that time, she had very little emotional support, she says, and "a program like this would have helped me."

Neal Baer '95 and Chris Antenucci '95 are members of Boston Outreach, a 10- to 12-week sex education course for Boston junior and high school students taught by HMS students. "We encourage the medical students to always be open to questions and to answer them frankly," says Baer.

In addition to issues around safe sex and AIDS, pregnancy, birth control and abortion and other matters dealing with sexuality, the curriculum also includes discussions of violence within relationships and in the home, and alcohol and drug abuse.

"I was surprised how informed the students were about many things, especially AIDS," says Antenucci. "But there is a huge gap between knowledge and behavior."

The course is designed to make room for full expression without judgment; the high school students write their questions out beforehand, instead of asking them out loud. "We tell them that there are no questions that are off base, or off limits," says Baer.

While many organizations continue year to year, students also have free reign to begin their own projects. "It's pretty easy to do," says Frankel. Besides a tremendous commitment and energy on the part of the students, "it involves me saying, 'poof, you're a group'."

Involvement in community-oriented organizations corresponds well with many of the students' goals in medicine—"A lot of us are headed in the direction of primary care," says Shawn Nassari '95 of himself and his classmates in HOPE—and also with their pasts. "One-third to one-half of HMS students have volunteered in community health projects before coming here."

Terri L. Rutter

photo by Gordon Telford, MD

Information Gap

HIV and the Health-care Worker

by David M. Bell

JUNE 1990

I have just arrived in my hotel room in San Francisco, where I am attending the International AIDS Conference. I work at the Centers for Disease Control and Prevention (CDC), studying the risk of HIV transmission in health-care settings and developing recommendations to reduce this risk; tomorrow I will be giving a talk on the subject. Outside my window, an ACT-UP demonstration is beginning. "The government has blood on its hands!" proclaim the demonstrators' signs, painted with big red palm prints. I feel uncomfortable. Because of threats of violence (which fortunately never materialized), the conference organizers have employed bodyguards for the most senior people at CDC, FDA and NIH.

I check my voice mail. One message is unusually cryptic and guarded. I strain to hear it above the din outside. A colleague at CDC is informing several of us attending the conference that an important meeting has been scheduled immediately upon our return to Atlanta to discuss the implications of laboratory data that have become available regarding an "NIR investigation." For several months an investigation has been under way of a young woman in Florida who has AIDS but no identified risk ("NIR") for HIV infection. Curiously, her dentist also has AIDS. With no other leads as to the source of the woman's HIV infection, molecular virologists at CDC have been comparing DNA sequences from HIV strains obtained from the woman and her dentist.

The next day at the conference I feel overwhelmed by the tragedies and challenges portrayed on a worldwide scale: millions of HIV infections extending into new countries and continents, young adults cut down in the prime of life, "AIDS orphans"—the first time I have heard this term, referring to children whose parents are either dead or dying of AIDS and who may be infected themselves. The numbers keep growing; no wonder the activists want us and our governments to do more. One talk relates to my own work and brings tears to my eyes. A physician named Hacib Aoun recounts his story of becoming infected on the job and the awful problems he and his family encountered afterward. It is not the first or the last time I will hear such a story.

In my talk, I review the (then) meager data on the risk to health-care workers (HCWs) and CDC recommendations to reduce the risk. There are plenty of sharp questions afterward, both in public and in private. A surgeon says that universal precautions

are unrealistic; he wants to test his patients for HIV infection preoperatively. Another critic chides CDC for not recommending safer needle devices, saying that CDC's recommendation not to recap used needles is "blaming the workers for their own injuries." Some people can't obtain adequate supplies of gloves and wonder how important gloves are in preventing HIV transmission anyway.

One hospital epidemiologist says that orthopedic surgeons in his hospital have bought their own "space suits" with a self-contained air supply, because they are concerned about possible HIV transmission by aerosol. He wouldn't necessarily care what the surgeons bought for their own use, but now the other operating room personnel are demanding that the hospital purchase these expensive devices for them as well.

One irate gentleman asks how long CDC is going "to continue taking its marching orders from the gay lobby before you guys wake up and start practicing sound public health principles." A number of questioners believe that CDC underestimates the risk to HCWs, either inadvertently or even deliberately, so that HCWs won't be afraid to take care of patients with AIDS. Some labor unions and other groups are particularly concerned that data that could be interpreted as signifying "low risk" may provide a false reassurance to HCWs, or may undercut their demands that cost-conscious hospital administrators purchase safer devices and protective equipment.

Controversy is not new to the CDC component where I work.

People debate the use of AZT post-exposure; I see a colleague from a developing country roll her eyes—she has told me that she doesn't even have enough AZT for her patients with AIDS. The proposed OSHA regulations for preventing occupational exposure to bloodborne pathogens have been released for public comment; there is no shortage of opinion. It seems to me that there is a common thread applicable to all of the controversies: the more limited the data, the more vociferous are the opinions.

Controversy is not new to the CDC component where I work, the Hospital Infections Program, which has a mission to prevent infection transmission in hospitals and other health-care settings. Epidemiologists and laboratory and statistical personnel in this program conduct a variety of activities, including surveillance and investigation of infectious disease transmission in health-care settings and laboratory studies, related to topics such as disinfection and sterilization and mechanisms of antibiotic resistance. With the assistance of expert consultants inside and outside of CDC, we also develop and evaluate prevention recommendations.

Before AIDS, the controversies were predominantly technical. They also involved cost-effectiveness concerns, but rarely dealt with the politics, the human rights issues, the stigma, the misinformation, and the raw fear and emotion that have complicated the fight against AIDS.

CDC recognized a potential risk to HCWs as early as 1982, when the

Lost in the Silence

Physicians with AIDS are like the unseen trees in the forest, falling without anyone hearing them.

That's the analogy Ben Schatz draws to show how HIV-infected physicians are losing their jobs while society, and in some cases the medical establishment, doesn't see or refuses to listen to the problem. Schatz is executive director of Medical Expertise Retention Program (MERP), a resource and counseling center for physicians and other health-care workers with HIV infection. "There is silence, I think, because these people are considered shameful," says Schatz.

Alvin Novick '51, professor of biology at Yale University and founder of MERP, got the idea for an organization dedicated to the needs of HIV-positive physicians following a 1985 conference sponsored by the CDC that focused on AIDS patients. "That's when the first electric lightbulb went on about physicians with HIV infection," he says. "I thought, 'we're going to have infected physicians and no one will know what to do with them'."

Through the American Association of Physicians for Human Rights—a national organization concerned with the health care of gay men and lesbians and with ensuring equal professional access for gay and lesbian physicians and medical students—Novick launched MERP in August 1990. "As far as we know, we are the only organized resource of this sort for HIV-infected health-care providers," says Novick.

MERP, which is based in San Francisco, has served over 1,000 clients, 90 percent of whom are physicians and medical students (the remainder include nurses, dentists and other allied health personnel). Its purpose is to provide short-term crisis counselling and to make referrals for those who need something longer; to help locate employment for those

agency recommended that HCWs use the (now obsolete) category of "blood and body fluid precautions" when providing care to patients with AIDS. Subsequently, CDC recommended that infection control programs incorporate principles of "universal precautions," a system of infection control in which blood, certain other body fluids, and tissue of all patients are assumed to be infectious. Universal precautions include the appropriate use of handwashing, protective barriers (such as gloves), and care in the use and disposal of needles and other sharp instruments. Also, instruments and other reusable equipment used in performing invasive procedures should be appropriately disinfected or sterilized.

CDC recommendations allow the use of preoperative HIV testing as a supplemental infection control measure, provided that the patient's informed consent is obtained, pre- and post-test counseling is provided, the confidentiality of the test results is ensured, and the patient receives optimal care regardless of the test results. (It is sometimes forgotten how controversial universal precautions were when first introduced, because today these principles are widely accepted.)

JUNE 1990, THE WEEK AFTER THE AIDS CONFERENCE

I am with a dozen people in a small, crowded room at CDC; epidemiologic and laboratory data about what will soon be called "the Florida dentist case" are being presented. In a drama that will be replayed nationwide during the coming year, the discussion is alternately heated and sober as people's initial skepticism yields to a grim realization that a young woman may well have acquired her HIV infection from her dentist. It is clear that CDC is embarking on one of its greatest challenges to date and that whatever the agency does or ultimately recommends, it will be strongly criticized. Several conclusions emerge from the meeting: first, additional investigations must be urgently pursued on a number of topics related to the dentist, his practice and his other patients. Although it is believed highly unlikely that the similarities between the DNA sequences from the patient and dentist could be coincidental, other strains of HIV circulating in the community must be sequenced as background "controls."

Second, the available information must be published quickly. No additional data that CDC could expect to collect in the near future would substantially alter the current information. Scientists, the public, and policy makers at all levels depend on CDC for timely, accurate data on the HIV epidemic; if CDC is perceived as having concealed information, the agency's credibility as an honest purveyor of data will be damaged. Third, CDC must have a plan to lead the upcoming debate on the implications of this episode; this will begin shortly after publishing the information by convening a meeting of representatives of about 70 organizations to review the data and current prevention guidelines.

Issues related to HIV-infected HCWs are to consume an increasing proportion of time over the coming year, but our branch in the Hospital Infections Program, the HIV Infections Branch, will try to stay on course studying the epidemiology of blood exposures and HIV transmission to HCWs, and the efficacy of measures to prevent these exposures. Surgeons are particularly

Photo courtesy of American Association of Physicians for Human Rights/Gay and Lesbian March on Washington, March 1993.

who are displaced, including the development of retraining programs; and to work with the CDC and state agencies to design practice guidelines for HIV-infected physicians.

"Most important of all is an informed, sympathetic voice on the phone," says Novick of MERP's service. "Physicians in this situation need to have someone to whom they can reach out and can trust."

In 1991 the CDC reported in *JAMA* that 5,815 people with full-blown AIDS were employed at some point as health-care workers (HCWs). MERP estimates the numbers to be much higher. For those still in practice, their professional future

concerned; several studies indicate appreciable percutaneous injury rates during surgery and no reliable data are available to assess surgeons' cumulative risk of HIV infection.

In five days, 3,420 surgeons are counseled and tested.

MARCH 1991

I am inside a huge white tent at the Disneyland Convention Center in Anaheim, California. The tent, which is erected in a parking lot, houses 15 counseling booths, 15 phlebotomy stations, and various other support facilities for an unprecedented event: an anonymous HIV serosurvey of orthopedic surgeons, co-sponsored by CDC and the American Academy of Orthopaedic Surgeons (AAOS), at the AAOS annual meeting. This is the culmination of three years of hard work on the part of CDC and AAOS personnel, requiring numerous discussions and approvals at multiple levels within both the AAOS and the federal government.

It is quite a spectacle. There are periods of relative calm interspersed with frenetic activity as waves of surgeons enter the tent between convention sessions. Reporters are politely excluded from the tent while surgeons are inside—some reporters are more understanding than others. Surgeons are reminded to cover their name badges to preserve anonymity. Then they are routed to stations where they receive individual, anonymous pre-test counseling and complete a questionnaire soliciting information on demographics, practice characteristics and nonoccupational risks. Their questionnaires will be linked by bar code to a tube of their blood, which is drawn at the next station.

HIV antibody screening by enzyme immunoassay and, if appropriate, confirmatory testing by Western blot is performed by technicians working around the clock under the oversight of CDC personnel at a nearby laboratory. Surgeons return in 36 to 48 hours to retrieve their results. Testing of such a large number of specimens with such rapid turnaround time has never been done before.

To meet Public Health Service requirements for individual, face to face counseling of persons receiving their HIV test results and AAOS requirements for preserving the surgeon's anonymity, a system has been devised whereby each surgeon receives post-test counseling for both positive and negative results; the surgeon may choose to reveal his or her results to the counselor, but is not obliged to do so.

Couriers depart periodically with tubes of blood and return with batches of coded envelopes containing test results. The phones in the tent ring with calls from Atlanta, Washington and the news media inquiring how things are going. CDC and AAOS personnel hurry past with walkie-talkies. There is a lot that can go wrong, but doesn't. In five days, 3,420 surgeons are counseled and tested, 48 percent of those attending the meeting. The participants appear delighted; many volunteer that they would be afraid to be tested back home for fear of not remaining anonymous.

Two surgeons are positive, both of whom report nonoccupational risk fac-

lies in a precarious state. "Although the issue has faded from the headlines, thousands of HIV-positive physicians are losing their jobs," says Schatz.

Physicians with HIV are protected from unfair discrimination under the Americans with Disabilities Act. What makes these doctors unwilling or reluctant, however, to sue their employers if they have been unfairly discriminated against, says Schatz, is the fear of reprisal from their patients in the form of malpractice suits, or that they'll be sued for emotional distress. So, physicians quietly leave their practices and the issue remains hushed within the medical community and the public at large.

But it doesn't have to be that way. "We should be demanding for them to have the right to continue to practice medicine," argues Novick. "HIV-infected physicians have the right to be treated fairly and squarely, not be stripped of their opportunity to make a living."

The public concern over physicians with HIV has centered on the fear that patients from the "Florida dentist case" might just be the tip of the iceberg, and that all patients of HIV-positive physicians are in the same danger. As of March 31, 1993, however, over 19,000 patients of 57 HIV-infected health-care workers (including surgeons, physicians, medical students, obstetricans, dentists and dental students) were tested, and no HIV infection related to their being a patient was found, as reported in *Morbidity and Mortality Weekly Report (MMWR)*, May 7, 1993. But, this is not a reason to be overconfident.

"Those data are very reassuring in general," says David M. Bell '77, chief of the HIV Infections Branch of the Hospital Infections Program at the CDC, "but they don't necessarily tell you what the risk is for one particular surgeon with AIDS doing one particular procedure in a given situation." For example, a procedure such as vaginal hysterectomy, in which the frequency of needlesticks is elevated and hepatitis B virus has been transmitted from surgeons to patients, might present a higher risk to patients than other operations.

In a *JAMA* editorial accompanying two such retrospective studies involving the practices of two surgeons, (April 14, 1993), the authors urge similar caution in evaluating the results. They argue that because the testing of patients is voluntary, those who may have been infected with HIV from their physicians could

tors for HIV infection on their questionnaires. People heave sighs of relief. Although the study has limitations and does not mean that orthopedic surgeons are not potentially at risk for HIV infection, it does suggest that there is not a large number of orthopedic surgeons out there with previously undetected HIV infection.

I have tremendous admiration for the willingness of the AAOS to co-sponsor this study. It was a courageous step into unknown territory and it benefited many people in addition to the individual orthopedists who were tested. Since the results put some boundaries on the hitherto unknown and widely feared risks of HIV transmission during surgery, the study benefited the entire surgical community and also, I believe, all health-care workers, all people with HIV infection, and the public at large.

This project is an example of the rewards of perseverance in collecting data on HIV-related issues, which nearly everybody agrees are critically needed but difficult to obtain. Concern about what the results of a study might show simply must not be permitted to prevent necessary data

Couriers depart periodically with tubes of blood and return with batches of coded envelopes.

from being collected. Although the data may turn out to have troublesome implications, sound public health policies require sound scientific data.

JULY 1991

I am reviewing the galley proofs of CDC's "Recommendations for Preventing Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Patients During Exposure-Prone Invasive Procedures." This document has gone through over 100 drafts, and for the last three months, has been under review in Washington. During that time, events have taken an ugly turn.

Impatient with CDC's delay in issuing recommendations, state and federal legislators, licensing boards, hospital administrators and insurance companies have taken matters into their own hands. Bills have been introduced, and in some cases passed, that would require HIV testing of HCWs, prohibit HIV-infected HCWs from engaging in patient care activities, and require past and future patients to be notified of the HCW's HIV positive status. In a sensational example, an amendment has been introduced in the U.S. Senate (it was subsequently passed by a large majority in the Senate, but deleted in a House-Senate conference committee) that would provide fines and jail terms for HIV-infected surgeons and dentists who perform invasive procedures.

Kimberly Bergalis, having publicly stated that she was one of the patients infected in the Florida dental practice and is now in the final stages of AIDS, has called for mandatory testing of HCWs at a televised Senate hearing. The names of HIV-infected HCWs are being reported in the news media.

It is not clear to me that any CDC recommendations at this time will calm the situation. What is needed are more data from retrospective studies

have chosen not to participate in the investigation. Secondly, they say that look-back studies "are unlikely to detect the highly infectious health practitioner who might pose a substantially higher risk to patients."

"One of the things that makes this issue most difficult is the relative lack of data," says Bell.

Part of the debate revolves around whether HIV-infected physicians should be allowed to perform invasive or exposure-prone procedures. The CDC has issued a definition of an invasive procedure—namely, "surgical entry into tissues, cavities or organs or repair of major traumatic injuries." In an attempt to draw up a list of invasive procedures that could be identified as "exposure prone," the CDC sought the advice and counsel of professional organizations, many of whom felt that insufficient data were available at that point to create something so definitive. So, individual states, hospitals and other health-care settings currently design their own protocols for how HIV-positive physicians will continue to practice.

In July 1991, the CDC issued a set of recommendations for HIV-infected physicians. And, while the CDC does not advocate mandatory testing, says Bell, it does recommend that if an HCW knows that he or she is HIV positive, then the individual should seek counsel from an expert review panel, whose purpose is to determine under what circumstances the infected worker can conduct his or her job. The CDC also recommends that HIV-infected physicians inform their patients of their positive status before performing an invasive procedure.

Roy Schwarz, MD, senior vice president of medical education and science of the American Medical Association, disagrees that patients need to know. He argues that physicians needn't disclose their HIV status "any more than one might disclose that he or she has a cold that day, or a little coronary artery disease that causes occasional chest pain. We don't disclose that."

Schwarz does, however, agree with the CDC recommendation that physicians who think they may have been exposed to HIV should voluntarily be tested. The AMA also advocates the establishment of a review committee, made up of those knowledgeable about AIDS, to monitor the HIV-positive physician's health and well being and the quality of their practices.

Novick agrees with this guideline: "We tell physicians

of patients who have undergone invasive procedures performed by HIV-infected HCWs to better assess the risk. The galley proofs go to the printer. A sentence is added recommending that patients be notified of the HIV-infected HCW's positive status before undergoing an exposure-prone invasive procedure. (The following month, Congress passes a law requiring that within one year, states must certify that CDC guidelines or their equivalent have been instituted in the state or lose substantial federal public health funding.)

It has been a hard year. The discovery that five patients, not just one, were infected in the Florida dental practice convinced even many skeptics that transmission to patients in such a setting is possible. However, the precise event(s) that resulted in transmission have not been identified, an information gap that has also characterized investigations of the transmission of another bloodborne virus, hepatitis B, from HCWs to patients during invasive procedures.

Many theories have been advanced, including that a possible failure to sterilize or adequately disinfect dental instruments was somehow responsible for transferring the dentist's virus to the five patients, or even that the dentist deliberately infected them. While these hypotheses cannot be ruled out, the CDC and Florida state investigators who evaluated the dentist's practice believe that the preponderance of data do not support them.

This hearing serves the valuable purpose of holding everybody's feet to the fire.

The episode has alarmed the public and also alarmed those who rightly feared the consequences of various draconian measures that have been proposed, such as mandatory HIV testing of health-care workers and blanket restrictions on the patient care activities of those infected. CDC has received numerous comments at public meetings and in writing, many of which are notable for their thoughtfulness, wisdom and insight. Quite understandably, given the limited scientific data available, some individuals and organizations consider their own legitimate self-interest and their own political values in formulating their positions.

As the rhetoric escalated, it has been striking to see proponents of diametrically opposite points of view each arguing that their positions were based solely "on science," while the opposing positions were "based on politics." Ultimately, many people seem to agree that the biggest obstacle to achieving a consensus is the relative lack of important scientific information: lack of knowledge of the precise event(s) that resulted in transmission of HIV to the dentist's patients; lack of data to estimate precisely the magnitude of the risk of HIV transmission during various invasive procedures; and lack of data on the extent to which various factors might increase or decrease the risk. Lacking such information, CDC has been obliged to rely on surrogate data, such as knowledge gained from investigations of transmission of hepatitis B virus from HCWs to patients and studies of percutaneous injuries to HCWs during surgery and dentistry. Some individuals and organizations accept these data as a basis for recommenda-

it's their responsibility to work with people who know HIV to monitor them and to let them know when they're not fit." But that's it, he says. "We don't require draconian informed consent."

To help educate state medical societies, health committees and licensing boards to respond more positively to physicians with HIV infection—as well those with other impairments, such as disability or an addiction to alcohol or drugs—the AMA initiated the Physicians Health Foundation in November 1992. Another function of the foundation, says Schwarz, will be to provide funding to impaired physicians for a period of time until they recover. For the physician with HIV, that may mean retraining in another area that doesn't require invasive procedures, such as psychiatry or radiology, or in the business managment end of patient care.

"Hopefully we'll get to the point where this will be treated like an infectious disease, and not reacted to based on feelings of fear," says Schwarz.

While all the public outcry has been about patients' risk from their physicians, it is physicians, in fact, who are at greater risk of infection by their patients. As of March 1993, the CDC had received reports of 36 documented cases, and 75 possible cases, of HCWs in the United States who contracted HIV occupationally, compared to the 6 known cases of patients who contacted HIV through the one dentist in Florida.

Anticipating that fear of infection might be a concern, Harvard decided to do something to care for its HCWs. Harvard Medical Center—the school and all the affiliated hospitals—convened a committee in 1987 to address the impact of AIDS on patient care in Harvard-affiliated institutions, and to make recommendations. "The committee embraced the view that all patients deserve competent and compassionate care regardless of their HIV status, and that the health-care worker should assume whatever risks are involved in delivering that care," says Clyde Evans, PhD, associate dean for clinical affairs.

The university realized that some risk was involved in giving that care, so it began to discuss an insurance plan for HCWs who become infected. "If we're going to ask them to assume that risk, then the least we can do is provide a monetary benefit if something happens." In October 1992, the Harvard-affiliated medical institutions instituted the

tions; some do not.

Acutely aware of the need for additional data, CDC provided funds and technical assistance to state health departments to collect data from "lookback studies" of patients who had undergone invasive procedures by HIV-infected HCWs. (The publication nearly a year later in CDC's *Morbidity and Mortality Weekly Report*, indicating that no additional cases of transmission from infected HCWs to patients had been identified, would offer a clearer perspective on the risk, and ease the national debate.)

In response to comments from professional organizations that it was not possible for them to create lists of invasive procedures designated "exposure-prone," CDC Director William Roper subsequently would write to all state and territorial health departments saying that exposure-prone invasive procedures are best determined on a case-by-case basis, taking into consideration the specific procedure as well as the skill, technique and possible impairment of the infected HCW.

FEBRUARY 1992

I am at a Congressional hearing on health-care worker safety and needlestick injuries, chaired by Congressman Ron Wyden of Oregon. The purpose of the hearing is to investigate why safer needle-bearing devices are not more widely available to HCWs. An example would be a phlebotomy device with a "sliding sleeve," which pushes forward to cover the needle tip after use, reducing the likelihood that the used needle could injure a HCW.

It is high drama, just like on television. In fact, there are 11 television cameras stationed around the packed hearing room. The first witness is a nursing assistant from California who testifies behind a screen to preserve her anonymity. She recounts her experience of becoming infected with HIV while on the job; she was stuck with a needle concealed under a pad of gauze while cleaning up after a blood-drawing procedure. Another witness, who works in a hospital laundry room in Michigan, empties onto the witness table a big bag full of needles and sharp instruments that he says were recovered in the laundry.

Several more witnesses, representing hospitals, needle manufacturers, professional societies and others, describe the need for safer devices and various obstacles to their more widespread use. These include cost and the difficulties faced by small manufacturers in marketing a new device. Some witnesses state that hospital administrators who purchase devices are unaware of the potential benefits of safer devices and tend to blame the HCW who gets stuck, rather than recognizing that the device may be inherently unsafe. There are repeated calls for more federal leadership. FDA and OSHA are urged to use their regulatory authority to require the use of safer devices. CDC is urged to collect more complete data on HCW risks, including the role played by various devices in needlestick injuries.

When it is my turn, I am seated at the witness table with representatives from the FDA and OSHA. We are referred to as "the Administration witnesses," a term that does not fit well with my professional self-image, but I am told this is customary practice. My testimony emphasizes CDC's support for safer needles and other devices to protect HCWs, and underscores the need for these devices to be evaluated in clinical settings for safety, efficacy and effect on patient care before their widespread use. I also explain CDC surveillance and research projects related to HCW safety.

This hearing serves the valuable purpose of holding everybody's feet to the fire. Implementation of universal precautions has been highly effective in reducing the number of mucocutaneous blood exposures among HCWs, but has been less effective in reducing the frequency of percutaneous injuries, which represent the greatest risk for infection transmission. Studies have found that injuries related to common procedures such as phlebotomy, which generally occur after the needle has been withdrawn from the patient's arm and is no longer necessary, could be prevented by device redesign or substitution. Admonitions against needle recapping and improper needle disposal have had only limited success; it

Work-related HIV Benefit Plan. The plan provides a lump-sum payment of $100,000 to any worker who becomes infected as a result of a documented, work-related exposure. To date, no claims have been filed.

"Health-care workers who, tragically, become infected with HIV while caring for others deserve our support and financial assistance," says Richard Nesson, president of Brigham and Women's Hospital and chairman of the Harvard Medical Center AIDS Committee.

With the plan there has also been an education campaign about the necessity of complying with universal safety procedures in the hospitals. Health-care workers are encouraged to report incidents that may have put them at risk, and to be tested should they feel they may have been infected.

"We hope this will help bring HIV out of the closet," says Evans, who chaired a committee of human resource directors charged with devising a method of how to incorporate the plan. "Every step we can take to treat this like a biomedical disease rather than a curse is a step towards relieving some of the stigma associated with HIV."

Terri L. Rutter

is clear that inherently safer devices are needed.

The situation is more complicated in surgery, obstetrics and dentistry, where sharp instruments or objects may be continuously present and procedures may involve multiple personnel or work in confined anatomic spaces. In these specialties, device improvements will be important, but safer techniques and personal protective equipment are also needed.

Development, evaluation and subsequent widespread use of safer, cost-effective devices requires cooperation among researchers, manufacturers, hospital administrators, HCWs and government agencies. Progress has been sluggish, in part because no single manufacturer, organization of HCWs, institution or government agency has the resources or authority to accomplish all the necessary tasks. To promote communication among users, purchasers, manufacturers, researchers and government agencies, CDC, FDA and OSHA co-sponsored a conference on device-mediated bloodborne infections in August 1992. In February 1994 CDC and the American College of Surgeons will co-sponsor a scientific meeting in Atlanta on new methods for the prevention of bloodborne pathogen transmission in surgery and obstetrics.

DECEMBER 1992

I am meeting with the senior staff of our branch, planning how best to use our limited resources in the coming years. It is a very exciting meeting, as we believe that substantial progress has been made and we are moving forward. While we will continue to address questions about the risk of HIV transmission, this year we are embarking on projects that will evaluate novel preventive measures.

In collaboration with investigators at a number of hospitals, projects will be implemented to monitor and evaluate the role of new devices, techniques and/or protective equipment in preventing percutaneous exposures to blood during phlebotomy and during surgery, starting with obstetric and gynecologic procedures. There are a number of difficult methodologic problems to be worked out in these multicenter studies evaluating multiple interventions, but we are optimistic. It is our vision that with increasing progress, the day will come when no procedure performed using appropriate equipment and technique will involve an appreciable risk of blood contact or bloodborne pathogen transmission to either HCWs or patients.

JANUARY 1993

As I write, I reflect a bit. My career since completion of medical training has included academic medicine, laboratory virology, practicing general pediatrics and, since 1987, my work at CDC. Although every facet of medicine has its own rewards and frustrations, I have found public health to be particularly exciting because of the opportunity to improve health and prevent disease on a large scale. It is a tremendous privilege to work at CDC because of the great number of talented, dedicated people in this agency who share a commitment to prevent disease by acquiring scientific data and developing prevention strategies based on these data.

Prevention strategies for certain health problems that the public cares deeply about, such as AIDS, often become controversial. It is particularly important in such cases that scientists be free to collect all pertinent data, that these data be widely disseminated for critical review, and that public health recommendations based on these data be developed with ample opportunity for review and comment by the scientific community and the public at large. Like clinicians, however, public health professionals must occasionally make important recommendations based on data that are incomplete or permit conflicting interpretations. In these situations, recommendations will inevitably be influenced by society's values, as transmitted through elected officials and legal traditions. In such instances, it is especially important that the limitations of the available scientific data be clearly presented, and that other variables influencing the recommendations be clearly identified. Efforts must also be made to collect additional data, and to modify recommendations as additional data become available.

As of December 31, 1992, CDC had received reports of 33 documented and an additional 69 possible cases of occupationally acquired HIV infection in HCWs in the United States, a toll that is sure to increase in future years. Even when a safe and effective vaccine for HIV becomes available, as is now the case for hepatitis B virus, the potential for other bloodborne pathogens to be transmitted in health-care settings will remain. With the development and use of improved devices, work practices and personal protective equipment, and adherence to the principles of universal precautions, the risk of such transmission will become increasingly small.

During the coming years, we physicians can calm troubled waters by neither exaggerating nor understating the risks, and by insisting that scientific data form the basis for all discussions and recommendations. We physicians must also set an example by complying with, and insisting that others comply with, recommended infection control precautions.

David M. Bell '77 is chief, HIV Infections Branch, Hospital Infections Program, at the National Center for Infectious Diseases, Centers for Disease Control and Prevention in Atlanta.

Presidential Health, Press and Politics

Balancing the individual's right to privacy and the public's right to know.

Highlights of a March 8, 1993 forum sponsored by Harvard Medical School and the Joan Shorenstein Barone Center, John F. Kennedy School, Harvard University.

DANIEL C. TOSTESON '48
HMS Dean and Caroline Shield Walker Professor of Physiology
This forum is an opportunity to think together about the need of people to know about the health of the President and of presidential candidates, the need of individuals for privacy—even Presidents—and the need of physicians to honor their ancient obligation to treat information, which they glean from their patients, as privileged. These issues are not new, but they have drawn increased attention in recent times.

MARVIN KALB
Moderator and Director of the Joan Shorenstein Barone Center on the Press, Politics and Public Policy, JFK School of Government
Is there a proper balance that can be struck—if a balance has to be struck at all—between a candidate's right to privacy and the public's right to know?

American history is rich with examples. In 1944 President Roosevelt's doctor told the press and, through the press, the American people, that the President was in good enough shape to run for a fourth term. He certainly was not. He died the following year. In 1961 President Kennedy's doctor, aware of stories that the President had Addison's disease, told reporters that he had a mild adrenal deficiency. Last year there were rumors that President Bush was sick and stories about ailments never confirmed.

The most famous story of last year, though, was former Senator Paul Tsongas's episode of recurring cancer. Was this presidential candidate leveling fully with the American public? Were his doctors leveling with the American public? Were his doctors somehow putting themselves in the position as spokesmen in a political cause rather than doctors dealing with a complicated medical problem? Did the candidate and his doctors both have a higher ethical and social responsibility to the American public? Does a presidential candidate have a right to privacy? In this case, I'm talking about a right regarding his or her medical history.

If so, does everything have to be revealed, or can part of it be revealed? And on the other side, what is the public's need or right to know these issues, in part or in whole?

ALLAN BRANDT
HMS Professor of the History of Medicine
These issues bring together two very significant trends in American social, cultural and political life of the twentieth century.

One is the respect we as a society have for privacy. Within the constitutional law, we've seen an increase in respect for the right of privacy. Many have argued that privacy is the critical bedrock on which any medical relationship rests. Even if there has been deterioration in respect for medical confidentiality in the course of the twentieth century, we continue to have tremendous respect for the idea that medicine really cannot take place without privacy and without confidentiality.

On the other hand, within our political process, we have seen an enormous turn in the course of the twentieth century toward placing value on disclosure and honesty, even though we recognize that very often

In 1944 Roosevelt's doctor told the press that Roosevelt was in good enough shape to run for a fourth term; but in fact he died the next year. In a rare photograph, courtesy of Saul Benison, PhD, FDR is shown with his braces.

those principles haven't guided political practice. These two very powerful trends in American culture come into conflict in today's discussion.

From an historical perspective, it's worth noting that some of the Presidents who earned a great deal of respect for what they accomplished may have been physically incapacitated while actually serving. I think that is an important caution.

There is a third issue on which there is consensus. The public has an interest in the health of its President and its leaders. The mechanisms by which that information gets to the public, and how it is understood will be a topic on which to base recommendations in the coming months.

There seems to be an assumption in many of the discussions on the public and its need to know that medical data are clear, objective, scientific, and once put out, and will be understood by all in the same way. But, in fact, the kind of information that we have an interest in knowing is enormously complex, ambiguous, negotiated typically within intimate relationships between patients and doctors, and therefore, in the public realm, may take on fundamentally different meaning. Politics and medicine may be much more alike than we would want to admit.

SISSELA BOK
Ethicist and Research Fellow at Joan Shorenstein Barone Center

We have to take seriously the anguish that Senator Tsongas must feel now in retrospect, in looking back at the campaign and thinking, "What might have been?" We must also take seriously his proposal that there should be a review of candidates' medical records. I think that we should begin thinking now to plan carefully for some kind of process for the next election so this sort of thing will not happen again.

The public does have a right to know everything about a candidate's health that bears on the way the candidate may carry out presidential duties. On the other hand, I would not go so far to say that everything about a person has to be known by the public and by the press. I think we could come very close to a kind of reversal of *1984*. You may remember in Orwell's novel, we see Winston Smith cowering in his apartment. There are all kinds of ways in which big government, like Big Brother, can spy on him. I hope that presidential candidates and Presidents themselves can have more privacy than that.

Let us say, for example, that a President cannot conceive babies, or has spells of incontinence. I do not see any reason why the public should know any of that. There are other private matters that some candidates might want to reveal, but that nobody ought to have to reveal. It is dehumanizing to have no corner of their lives that are their own.

If we deprive a person of the possibility of privacy, then the candidate or the President may not go to the doctor with something that potentially might be very important. We have to be very careful not to place this extra burden on candidates and on Presidents. It is very demanding to run for such an office. We don't want to make it impossible.

In 1893 President Grover Clevelend was secreted away on a friend's yacht to have his oral cancer excised as the vessel sailed slowly up New York City's East River. The story was broken two months later by the Philadelphia *Press*, but since Cleveland was by then apparently in good health, few believed the story. Cleveland lived 15 more years and it wasn't until 1928 that the story was confirmed by one of the participants, a surgeon, W.W. Keene.

AP/Wide World photos

THE PRESIDENT
A VERY SICK MAN.

An Operation Performed on Him on Mr. Benedict's Yacht.

PART OF THE JAW REMOVED.

A Disease Whose Symptoms Gave Indications that It Might Be Sarcoma.

Mr. Cleveland's Present Condition Such as to Give Encouragement.

THE CASE NOT UNLIKE GRANT'S.

Four Days in Bed After the Use of Gas and Knife—Several of New York's Expert Physicians Concerned. Lamont's Devotion—The Several Causes.

FREDERICK SCHAUER, ESQ
Professor of the First Amendment, JFK School

This may be one of the numerous areas in which people expect the law to do far more work than it can or than it should. It seems quite clear to me that should a member of the press come across the medical records of a public official or candidate for high public office, there would be no way of preventing publication in advance, nor would there be plausible claim by the candidate against the member of the press. Our concept of the right to privacy clearly ends with the idea of "newsworthiness."

On the other side, it is equally clear that, under current law, if a candidate for high public office chooses to keep medical records private or a medical history secret, there is no way in which the law can be used to force disclosure.

We can think better about this issue if we minimize the use of the word "rights." Very often the word "rights" occupies a place in public discourse that is roughly the equivalent of yelling very loudly. It may be that a right is the conclusion that we want to make at the end of this or similar debates, but let's not load the debate at the beginning by suggesting an excess use of "rights." If we are talking about a competing range of needs or "interests," we might mention briefly three of them. The obvious one: a public interest in a democratic society in knowing about the qualifications, abilities, and all sorts of other details about its officials and its candidates.

Secondly, it is one thing for people like us to say that something is irrelevant. If the public decides that it is relevant—even though people like us think it is irrelevant—it is a difficult issue if either the press or others interpose themselves as filters.

The third side of this complex issue is the question of disclosure of certain confidential advice. Does this then prevent the President from getting the kind of advice that enables the president to do the job most effectively?

This is especially relevant to the psychological-psychiatric side of this issue. If there is a process that prevents the President from getting frank medical-psychological-psychiatric advice, will that interfere with the President's ability to do the job?

GLENN STEELE JR., MD
HMS Professor of Surgery and Chairman of Surgery at New England Deaconess Hospital

I bring to the discussion what it is like to take care of a patient, and specifically what it is like to take care of patients with significant illnesses. In my relationship with patients, the most effective therapeutic catalyst is not the technical or surgical aspect, but trust. The gratification as a doctor that comes from relating to the patient is not winning or losing, necessarily, but how the relationship is carried out.

I believe that a doctor's relationship with a patient should be based on minimizing any potential conflict of interest. The patient/doctor relationship is complex enough without having to be a press spokesman, without having to interpret data for the public's consumption, without having to introduce things that are beyond giving the patient as much truth as we possibly

can, so that the patient can make informed decisions about his or her care.

I think that truth is an ethical imperative, and I think it is a good tactic as well. My tendency is to come down quite dramatically on getting as much of the truth out as quickly as possible. Part of the political process is based on the intelligence of the electorate. By and large, decisions that are wrong are corrected, and I think that the most reasonable decisions can be made on the basis of complete and detailed truth.

However, I do not think that it is possible for the doctor to be both the physician to the patient and the spokesman for the patient outside of that personal relationship.

EDWIN H. CASSEM '66
HMS Professor of Psychiatry and Chairman of Psychiatry at Mass. General Hospital
United Airlines and the Boston Patriots demand a physical examination before professional pilots can fly or before professional athletes can play, but there is no such requirement that a candidate for president pass a physical exam.

In thinking about the balance between the public's right to know and the patient's right to privacy, I am reminded of the Tarasof decision. A young man at UC/Berkeley told a counselor that he intended to kill a female student. The counselor reported it to security, but not to the young woman, and the young man killed her. In a court ruling referring to the psychologist, the judge stated, "Protective privilege ends where public peril begins."

On another note, there appears to be a double standard in public attitude toward candidates and the President in office. If a presidential candidate had gonorrhea, then that would be sensational news. However, if a current President had gonorrhea, probably everyone would think, "We'd better treat this."

DAVID SHRIBMAN
Washington Bureau Chief, Boston Globe
When you run for President, you cede the right to privacy. In 1940, when President Roosevelt was contemplating the enormous symbolic and political question of whether or not to seek a third term, he chose as his running mate Henry Wallace, whom he probably would not have chosen in any other context except for the fact that he needed someone whom he felt looked healthy because he was worried that he was not healthy himself. Health questions do mold political choices like that. I don't think that there's anything that we in the press—and by "we in the press" I mean to say "we in the public"—ought not to know about someone's health.

TIMOTHY JOHNSON, MD
Medical Editor, ABC News
I believe the public has a right to know and that information about presidential candidates should be "filtered" through a panel of experts.

Traditional physical problems would be relatively easy to convey to the public. Emotional conditions are a difficult issue. Consider, for example, a person who 15 years earlier had been treated for a severe depression with medication for eight months, had been tapered off that medication and had done fine since. Would that information be important for the public to know?

Or in a social history that might be semi-routine for many physicians or in many medical records: what if a given candidate had had a period of sexual promiscuity 10 years ago, with no evidence of any resulting physical disability. Would that be important information for the public to know in this age of AIDS?

I think that it might be possible for a panel of experts, comprised of a distinguished group of physicians, to be appointed with the blessing of both the Republican and Democratic national committees, to sift through all the records of a candidate and convey to the public anything that might be detrimental to the potential performance of that candidate, without having to reveal in stark form everything that was in all of the records.

Reactions to a Review Panel

DAVID SHRIBMAN, *Journalist*
I suggest something like the Presidential Commission on Debates. The danger is that the bipartisan Commission on Debates itself became political in this last election, and there were debates about whether there should be debates.

The panel must have representatives whose inclination is toward dissemination rather than toward obfuscation. There is no longer a Cold War, and there's no longer a danger of nuclear holocaust, so arguing about somebody's mental stability with fingers on the button is less compelling.

TIMOTHY JOHNSON, MD, *Journalist*
I'm more optimistic about the ability of a panel to function if it were chartered from the start as an independent body, like the Federal Reserve Board. I think the way to go is for the two major parties to agree on a process that would set up an independent commission with competent physicians who could sort out the kind of conundrums that we have been raising.

The commission's charge should be to assess current ability to function in light of past risk. They may recognize that the public has a pejorative attitude toward emotional illness, and weigh that in the balance. But if in their expertise that episode has no bearing on current ability to function, it would not have to be revealed.

ALLAN BRANDT, *Historian*
If you look at recent biographies of Johnson and Nixon, there have been very serious allegations in the historical literature that, at certain times during their presidencies, they were

President John F. Kennedy was plagued by back problems, due to injuries sustained during WWII heroics as a PT boat commander. This portrait by William F. Draper shows him in a rocking chair that was specially designed for his bad back.

seriously emotionally unstable. This is where health enters the political realm.

The 25th Amendment

FREDERICK SCHAUER, ESQ, *First Amendment Scholar*
The 25th Amendment deals with sitting Presidents, not with candidates. It provides for presidential disability and succession. When the President does not believe that he or she is disabled, there is a procedure that can be instituted by the Vice President. The amendment seems to imagine that there could be a commission for purposes of determining a President's ability to serve. Its language is clear enough that there's no doubt that, if such a body were established, it would be upheld by the courts, if they touched it at all.

There is now a developing norm for disclosure of tax returns, without the encouragement of enforcing legislation or constitutional amendments, but with just the norms of candidate behavior. It may be useful to think that presidential health status could generate the kind of social pressures that have been produced about tax returns.

DAVID SHRIBMAN, *Journalist*
I think that the guiding assumption ought not to be that the public is foolish or capricious. We've just selected a President and a Vice President, both of whom have openly said that they have been involved at various times in their lives—and may even be involved now—in family counseling. This was done in part to appeal to a generation of people who have grown up with some ease about counseling. I think the public is more understanding about these things than they might have been a half generation ago.

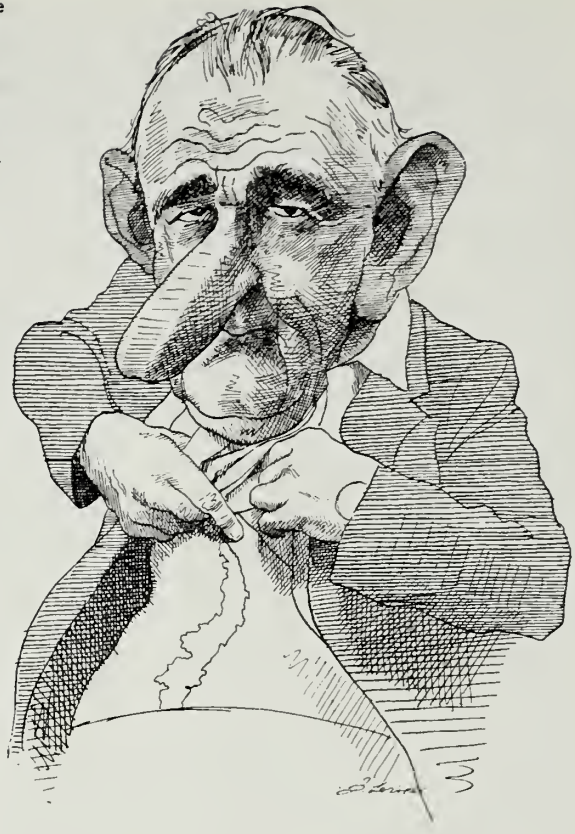
Consensus on Candidate Disclosure

MARVIN KALB, *Moderator*
Is there anyone on the panel who does not believe that the next time we have a presidential campaign, the candidates should level with the American public and make their medical records public?

FREDERICK SCHAUER, ESQ, *First Amendment Scholar*
One caution. I believe in that, but what will we do about presidential candidates' willingness to seek medical advice that they might need? Will there be a chilling effect on the willingness of people who are going into public life to secure the medical advice that they may need, especially in the area of psychological and psychiatric advice?

What Should Be Made Public?

MARVIN KALB, *Moderator*
Is everything to be made public, or just some things to be made public? Who decides that? Is that a responsibility of the candidate, or is it a responsibility of the press to seek out that information? Who then ends up being responsible?



President Lyndon B. Johnson unveiled the scar where his gall bladder was removed at a press conference in 1966, the scar caricatured here in the shape of Vietnam by editorial cartoonist David Levine. Drawing by David Levine. Reprinted with permission from *The New York Review of Books*. Copyright © 1966 Nyrev, Inc.

TIMOTHY JOHNSON, MD, *Journalist*
I would be skeptical about a candidate showing up with medical records and passing them around at a press conference. That's why I favor a screening process—dispassionate, to be sure, and I hope nonpolitical. But I think that it would not make sense to just throw out all this raw data at the press, and then to the public. Everything would be available in the screening process. Nothing would be held back from that.

SISSELA BOK, *Ethicist*
I think some sanity has to reign and be connected with what the public actually needs to know. Does the public need to know the candidate's birth weight, to take an extreme example. I'm willing to stand up and defend anybody's right to keep certain matters private. What happens in the bedroom should be private. Let's think, for instance, that a candidate has had an abortion or vasectomy. Now that is a very interesting case. The public would obviously like to know about that, but does the public have a right to know about it? It might be that many people would decide their vote on that.

DAVID SHRIBMAN, *Journalist*
I think that's a political choice as much as a medical choice. It's okay to ask a pro-choice woman if she has had an abortion, but it's not okay to ask a pro-life woman if she has had an abortion, because that's another way of asking whether she's a hypocrite.

FREDERICK SCHAUER, ESQ, *First Amendment Scholar*
The candidates are asked all the time whether they are hypocrites, and they all say "No!" This kind of information, once it enters the political process, becomes part of the process. Candidates are always trying to restrict information of one kind or another, and the press is always aggressively pursuing it.

What I am hearing on the panel is that we have actually seen some changes in the political norms of access to information about candidates. In light of this past election, these norms are likely to shift toward greater disclosure, regardless of requirements or legislation, or any other kind of proposal. And so it becomes a political calculation that I think candidates will have to weigh, both now and in the future.

MARVIN KALB, *Moderator*
I think that more and more we get into an overlap between the heart of our discussion and just pure old-fashioned politics. If we are really serious about this issue, I can't imagine whose responsibility would be greater, the journalists who ask the questions or the medical people themselves.

DAVID SHRIBMAN, *Journalist*
One of the things I worry about, being a newsman for a traditional newspaper, is that most of our general reporters don't really know anything about these issues. We have to be careful on our end of the business to make sure that we deal with this information in a responsible fashion, and to realize not only how little we know, but also the great possibilities of catastrophic error on our part.

Privacy of the President

MARVIN KALB, *Moderator*
Once a candidate is President and is in the White House, that person is in a cocoon, and the people who are outside the cocoon really don't know exactly what is happening. The President's health could be something that is kept within the family. No one is going to know about that.

GLENN STEELE, JR., MD, *Surgeon*
As you probably remember, for President Reagan there was some question as to whether the polyp that was found was really premalignant or not, and in general it was thought not to be premalignant. There is no question that political considerations went into his not having a full examination of his colon.

FREDERICK SCHAUER, ESQ,
First Amendment Scholar
It may be important that we not only be preoccupied with the President. This happens to a lot of public officials. One of the most obvious examples is Chief Justice Rehnquist's back and the medication he takes, which has been in and out of the news for the past seven or eight years. It may be that it is especially important to broaden our discussion because the President may be one of the few people among important public officials who can be whisked off to what is essentially a private hospital with major secrecy. Once we are talking about a large number of other public officials, this problem of someone being treated confidentially becomes much larger.

The Role of Spokesperson

TIMOTHY JOHNSON, MD, *Journalist*
I had the opportunity this afternoon to read the guidelines from the Dana-Farber Cancer Institute, which were developed precisely for this kind of question. I think they do an excellent job of delineating step-by-step how to deal with that situation, both to protect the patient and the institution.

MARVIN KALB, *Moderator*
The question of who should speak for the President or the candidate has to be kept in a political context. The politician or the spokesperson for the politician may get his or her information from the medical people, but the medical people should not be put in a position to be a spokesperson for a candidate or a President. It undercuts the professionalism of their responsibility, whereas a spokesperson has only one responsibility, and that is to speak for the president or the candidate.

How do you take what is very complicated information, even for medical students, and distribute it among the general public? How would you distribute it and, if you are forced to use the press—and I don't know who else there would be—should you try to educate the press? I don't know. How should you attempt to deal with it?

If we do learn more about the health of presidential candidates, if we agree that we will all try to get more information, doesn't it really invade the province of the physician?

EDWIN H. CASSEM '66, *Psychiatrist*
Well, it does invade it, but it already has in effect. There will be no candidates for President who will not know that their medical records are up for grabs. So we know that that will be a fact of our lives.

When the President falls ill, it is a tremendous opportunity for people to get more understanding about an illness and what goes into it.

CHRISTOPHER WALSH,
Chairman of Dana-Farber Cancer Institute—from the audience
We at the Dana-Farber Institute felt that we were in uncharted waters in balancing the patient's right to privacy and the public's interest or right to know. We felt the case with Senator Tsongas was a painful learning experience for us. For publicly prominent patients, our institution has implemented a policy that requires physicians to ask such patients whether they wish to waive confidentiality.

If they do, then we would request that the treating physician prepare a written summary to be reviewed by another physician who has no responsibility for the care of the patient. This written summary would be provided to the patient for review. The patient cannot edit or change it, but can only say that he or she is willing or not willing to waive confidentiality. That is the statement that would be made available to the press. We would appoint a spokesperson for the institution who is not one of the treating physicians, but who is generally knowledgeable in the area concerning the case.

If the patient does not waive rights to confidentiality, then the institution spokesperson will respond to the media that the institution will make no comment. We feel that we have learned from experience that this would be a very useful way to proceed. I think it has served us in good stead, most recently with Mr. Tsongas's rehospitalization and with other patients. We believe these are very useful guidelines, and we would be happy to have them debated by other institutions.

Troubled Times for Patient-Oriented Research

by Edward H. Ahrens Jr.

TWO YEARS OR SO AGO I WAS CHALLENGED to justify the continued existence of patient-oriented research and the special facilities needed for its performance. That challenge came mainly from molecular biologists (MDs as well as PhDs), who made clear their conviction that current and future problems of human health and disease will be more effectively and less expensively solved by research carried out strictly at the bench.

If that were a correct assessment, the further study of whole organisms (patients) in such facilities as clinical research centers would obviously become unnecessary. I translated their query to mean: can I identify any unresolved questions in clinical medicine that cannot be solved satisfactorily except by studies in "whole" human beings.

I brought this challenge to the attention of several dozen physician-scientists whose careers had been spent in patient-oriented research, and asked each to give me just one example of a disease problem that must be resolved by studies on whole patients. They replied with an impressive array of problem areas, most of which had a common underlying theme: there are no perfect animal or other laboratory models for the most threatening of human diseases—cancer, hypertension, diabetes, arteriosclerotic heart disease—disorders that have environmental as well as polygenic underpinnings.

I also heard howls of indignation over the perceived shortsightedness of the proposition posed to me. For many, the need for insightful investigations of patients by inquiring and sophisticated physician-scientists seemed so self-evident that it was difficult for them to take the challenge seriously!

Nonetheless, my personal observations of the changing milieu of patient-oriented research (POR) over the last 20 years have led me to pay respectful attention to the adversarial perceptions of my colleagues in molecular biology, however misguided they may be, and to demand of myself that I test their proposition that the classical physiologic, metabolic, immunologic and pharmacologic techniques of past years are not only outmoded but now are a waste of time and money. Two decades spent in defining the nature of the dilemma and in wrestling with possible solutions resulted in my recent book entitled *The Crisis in Clinical Research: Overcoming Institutional Obstacles* (Oxford University Press, 1992).

While writing the book, I found it necessary to define with great care what is meant by "clinical research," in order to determine whether all types of research encompassed by this term are "in crisis." The short answer to that question is that certain kinds of clinical research are thriving, while others are in deep decline. For instance, controlled clinical trials of new drugs and new procedures (which I call applied POR) are steadily increasing in number and are adequately funded. So too are studies with animal models of human disease and with bench research on materials of human origin. Although far fewer NIH grants are made for projects in outcomes assessment (now called health sciences research), that field of clinical research will undoubtedly gain increased financial support in the near future, in response to congressional concerns over the alarming acceleration of health care costs in the United States.

What is clearly in deepest trouble, on the other hand, is the type of POR that I call basic POR: studies of mechanisms in human disease. In basic POR, investigators seek to refine current characterizations of disease processes and to explore unresolved problems in

Edward Ahrens with a patient.

human biology by controlled observations of patients (or volunteers) and their environments, manipulating such extrinsic factors as diet, exercise, sleep, stress and drugs. Such mechanistic studies, which often are highly perceptive "fishing expeditions," require the special facilities of a clinical research center with in-patient or out-patient areas (or both) and specially trained ancillary staff.

Allow me to cite a couple of examples of new understandings in medicine that had their origins in basic POR. First, a Harvard story: the research developments that led to organ transplantation out of fundamental studies in renal disease, immunology and surgery by Merrill and Murray, and derivative studies elsewhere that led to bone marrow and liver transplantation by Thomas and by Starzl, respectively. All of the above had deep roots in observations and manipulations of patients.

Second, my own research experience in lipid and cholesterol metabolism: the observation that plasma lipid levels can be controlled by dietary exchanges of fats, and our subsequent studies of cholesterol homeostasis that defined how these effects are produced in the human body. Both of these examples involved important unresolved problems in clinical medicine that could not have been solved satisfactorily except by studies in "whole" human beings, and both required the facilities and trained personnel that we

today associate with clinical research centers. With great respect, I label these studies successful fishing expeditions.

What is the evidence that basic POR is in deepest difficulty? In brief, basic POR is drastically underfunded by NIH, the major supporter of all biomedical research in the United States. Less than 8 percent of all new traditional project grant awards (RO1 grants) go to basic POR, compared to 27 percent for animal models of human disease and 45 percent for nonclinically oriented biomedical research. As a consequence of an increasing lack of understanding in NIH study sections of the necessity for basic POR, the willingness of physician-scientists to apply for such grant support has been stifled. Furthermore, as experienced mentors have died off, the recruitment of newcomers to this area has sharply declined.

How is it possible that basic POR—which had its start in the United States in 1910 under Rufus Cole's direction as physician-in-chief at the newly founded Hospital of the Rockefeller Institute for Medical Research (RIMR)—has fallen on hard times in less than 80 years?

The RIMR was the brain child of Rev. Frederick T. Gates, a Baptist minister who was personal advisor to John D. Rockefeller Sr. in all his enterprises and philanthropies. In the late 1890s Gates realized that American medicine, compared to that in Germany, was shamefully unscientific, and he persuaded Rockefeller to organize and finance an institute in which the newly discovered scientific methods could be applied to revolutionizing the practice of medicine in the United States. Simon Flexner was chosen to be the first director of RIMR and, beginning in 1902, he successfully recruited experienced scientists, many from Germany, into the RIMR laboratories. (To name a few: Alexis Carrel, Walter A. Jacobs, Karl Landsteiner, Phoebus A.T. Levene, Jacques Loeb, Samuel J. Meltzer, Hideyo Noguchi, Eugene L. Opie, Peyton Rous, Richard E. Shope.)

Facilities are less and less utilized for the risk-taking fishing expeditions that are the hallmark of science.

The Hospital of the RIMR, which opened its doors to patients in 1910, was to have been directed by Christian A. Herter, a highly regarded NYC practitioner who had a laboratory in his private residence. It was the Flexner/Herter plan to staff the hospital with medical practitioners who would translate into clinical action the bright ideas of the scientists in the laboratories, while at the same time carrying on their practices in the city. But when Herter became ill in 1909, Rufus Cole of Johns Hopkins was chosen to take his place as hospital director. Cole—inspired by his mentor Lewellys F. Barker, chairman of medicine at Hopkins—had a very different concept for the organization of the hospital. He proposed to seek out young medical graduates who had already acquired some laboratory experience, often in Germany, and to engage them full time as caregivers to the research patients in the hospital. Equally important, as budding scientists, they would apply all available new laboratory techniques in their studies of a small number of important medical problems in the hospital.

It was Cole's objective that the hospital's full-time staff bring new insights (discoveries) to the study of human disease, while becoming adept in the laboratory skills needed for a brand new kind of scientific medicine. This plan was unprecedented, and its successful pursuit over the next 25 years led to the development of physician-scientists, many of whom were subsequently drafted as professors of medicine in medical centers throughout the United States. (To name a few: Oswald T. Avery, George P. Berry, Francis G. Blake, Alan M. Chesney, A.R. Dochez, Thomas Francis Jr., Michael Heidelberger, Currier McEwen, Hugh J. Morgan, Irvine H. Page, Francis W. Peabody, Thomas M. Rivers, William C. Stadie, William S. Tillett. And not to overlook Cole's enlistment of such outstanding PhDs as Rene J. Dubos, Rebecca Lancefield and Donald D. Van Slyke.)

Flexner's vision of the Rockefeller Hospital was of a research resource in which the novel ideas generated by chemists, physiologists, pathologists, immunologists and virologists in the laboratories would be put to the test by clinicians in the hospital—a flow of ideas from bench to bedside. Cole, in contrast, anticipated a two-way flow of ideas between the laboratories and the hospital. Indeed, it was his intention to develop a new breed of clinicians who were skilled in dealing not only with the clinical complexities, but also with the fundamental biological properties of the major medical problems of the day (labor pneumonia, syphilis, poliomyelitis, heart disease, and diarrhea of the newborn). He aimed to encourage physicians to train themselves in science while providing them ample opportunity to "discover."

Cole's model has prevailed at the RIMR (now called the Rockefeller University) over the past 80 years. His success in making this model work was so admired that it was emulated in many U.S. medical schools and hospitals.

Now, however, the Cole model of basic POR is seriously threatened by the increasingly prevalent view among molecular biologists that exploratory studies in whole human beings are no longer needed. The special facilities uniquely designed for performance of basic POR (known as General Clinical Research Centers and funded by NIH at some 75 sites throughout the

United States) are now all too often devoted to research projects with rigid protocols, and by investigators who are dependent on funding by NIH's RO1 grants. And, with the lack of discretionary funds available to the GCRC program directors, their facilities are less and less utilized for the innovative, risk-taking fishing expeditions that are the hallmark of discoveries in science.

All too often they are the sites in which controlled trials of new drugs and new procedures are carried out, even though many of these comparisons can be performed equally well in less sophisticated, less expensive surroundings. Indeed, their potential as educational centers for training in the science of medicine (the Cole model) is rarely realized. How refreshing it would be if they were regarded as major centers of intellectual excitement in the departments of medicine, pediatrics and neurology, whose members' professional time is increasingly eroded by the need for subspecialty income generation.

When the day arrives that the spectacular scientific studies now under way in our modern biotechnology laboratories reach the stage of translation into clinical realities, the need for physician-scientists skilled in the integrative methods that characterize research in whole patients will be all too apparent. Indeed, with the advent of gene transfer experimentation in human beings, that day already is dawning. Let us hope that the breed of integrative scientist (a truly endangered species) will not have been entirely crowded out by today's tunnel-visioned enthusiasm for bench work in molecular biology.

We must not forget that new diseases will continue to appear on the medical horizon, as well as old diseases in new forms, which must be recognized and explored by the kind of physicians whose nature it is to ask not only what, but how and why? Nor can we overlook that industry will continue to produce new environmental hazards as it generates new and "better" products. Clinical research centers were designed to meet these never-ending challenges for which specially trained staffs and facilities are essential.

So much for certain perspectives about clinical research, which have been laid out in much greater detail in the book referred to earlier. Suffice it to say that the "crisis in clinical research" is one of national dimension; it must be addressed by institutions country-wide, mainly by our medical schools and by the NIH, but also by private foundations.

What part can Harvard Medical School play in the process at this time? HMS is essentially a two-year school with its preclinical teaching activities centered around the Quadrangle. As such, it is free of the awesome encumbrances of financial attachment to any of its teaching hospitals, unlike most other U.S. medical schools. What's more, it is not riven or driven by the perils and entanglements of community responsibilities and income-generation derived from medical service to large urban populations.

The New Pathway is a bold experiment in medical education, characterized by small student groups in tutorials and by exposure of students in the first year to clinical problems via its patient/doctor curriculum. If the course directors of the New Pathway can be persuaded, enticed or cajoled into sincere support of basic POR, they could arrange to enlist into its cadre of tutors more MDs who are themselves engaged in POR. Medical students throughout their undergraduate years must be presented with the unsolved problems of medicine, not merely its accomplishments. From the start of the first year, students must have the chance to form strong collegial relationships with POR mentors, just as they now do with non-POR tutors in the Human Body and Organ Systems blocks of the New Pathway curriculum.

At HMS teaching hospitals, clinical department chairmen must demonstrate their interest in and support for basic POR by selecting outstanding physician-scientists to engage themselves and their PhD colleagues as partners in research on whole organisms, especially human beings. Furthermore, such investigators must be favored with dedicated time for POR by freeing them from the obligation to generate income from service to patients Why? Because basic POR is the most time-intensive type of biomedical research; it is slower and less certain in the attainment of its goals than research carried out strictly at the bench.

Individual professional success must no longer be measured solely in terms of the number of scientific publications, but rather in their quality and originality in bringing new understanding into the practice of medicine. In essence, the measuring sticks for promotions, salaries, tenure and prizes must be different for those physician-scientists who are integrationists than for those who are reductionists. Only when the crucial differences between integrationists and reductionists are recognized (in their training, facilities, and habits of thinking) can the HMS teaching hospitals hope to redress the disheartening imbalances that prevail today among the several kinds of talented researchers at these institutions.

If it wills to do so, HMS can again lead the way in basic POR as well as in undergraduate medical education. Fuller Albright, Soma Weiss and William B. Castle may be dead, but as examples of POR mentors at HMS, they will never be forgotten.

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Research:

*An Obligation Not An Option**

by Patricia K. Donahoe

"For what we have received, may we all be truly grateful." How often have we heard some rendition of that thought? As a young child leaning against mother or father in church, at family grace, in school, in camp, if you were so fortunate. You may have felt it more recently at the end of a day when you were unable to answer the unasked question "Why?" of a child paraplegic from a congenital anomaly. Or when you've looked into the eyes of an eight-year-old dying from metastatic tumor, who specifically asks you to "take care of my family"; or when a young adult with the complications of end-stage diabetes asks you to let him die with dignity; and when an elderly patient wants no longer to be a burden on his or her family. The same thought runs through your head when you hear, at the more global level, of the bombings in Bosnia or Northern Ireland, of atrocities in Iraq or Panama, or of famines in Ethiopia.

So here you sit, many having undergone severe hardships to be here with fine minds, disciplined bodies and organizational skills possessed by few others. The level of excellence represented by the platform presentations and posters attests to that. You are taught by a dedicated faculty in an institution with unprecedented resources, in a medical care system that, despite harsh criticism, is filled with men and women who, for the most part, are compulsive and sensitive in their devotion to curing disease, alleviating suffering and unraveling basic biological truths.

After exposure to a potpourri of different specialties or, as is the norm today, nonspecialties, you must find the one in which you can most effectively and happily serve out your obligation to humanity. Nowhere but in medicine do you have such a vast choice. You can have the mind of a mathematician or a physicist and apply those principles in radiology, cardiovascular disease, neurology or neuromuscular signaling; you can be a developmental or molecular biologist and clone genes, study ontogeny, study cellular migrations, interactions and differentiation; a microbiologist and track viruses, bacterias and prions; a biochemist and purify and crystallize proteins and study transduction pathways; an artist and perform surgery; or an optimist or egotist and think you can do it all.

It follows that "for what we have received," we have an obligation. Simply stated, that obligation is to be fearless and logical in our approach to solutions of difficult, unsolved problems. Having accepted the fact that research is an obligation and not an option, then you must establish a strategy for practicing that principle throughout the remainder of your professional career, weaving the obligation to research into the fabric of your everyday existence. This particular group of students—in many ways already surpassing its faculty by being eager, hardworking, incredibly smart and well organized—is an affirmation of the faculty's ability to choose the best and the finest.

It is important not to underestimate your capacities, which you can see are increasing every day. It's like the song in "A Chorus Line": "I can do that!" I'm sure you have learned also that accomplishment requires stamina and that stamina requires training to prepare you for what you must do.

Each day of experience increases your ability to encompass previously impossible tasks, helps you categorize the unsolved, and formulate approaches for their solution. Your obligation is to find the one, two or three areas that you enjoy, calculate the unsolved problems and put your attentions to them in ways that are compatible and specifically designed for you. For instance, if you are a computer hack and a computational genius, put your mind to three-dimensional mapping of the brain, the liver, the pancreas, the lung, and design a delivery system for gene therapy.

If you are an economist, put your mind to the seemingly impossible task of cost-control. Join one of the many doctors on the Health Care Task Force. And, if there aren't enough physicians on this and similar task forces, find out why and change it. Research that undertakes cost containment is as important as bench and clinical research.

Make it your obligation to make a new discovery or important contribution every two to three years. "I can do that!" Don't rest on your laurels and, what's more, be humble before your science or your science will humble you.

The revolution of molecular biology and the mapping of the human genome promise exciting revelations in the decade ahead. Those who have the intuition to know this is the right direction to pursue will be joined by those with an expertise to create the

*Presented as the keynote address for the 53rd Soma Weiss Day.

delivery systems. They may already be there in our academic and national defense laboratories ready to be dedicated toward peacetime and compassionate use. The techniques for investigative pursuits, be they bench or bedside, are very similar and entail analytical distrust and the energy and confidence to change, improve or confirm new systems.

You are obliged to choose an area and a problem that you feel compelled to solve. A compulsion over which you have no control. One you struggle with in the shower, or as you drive to work. One that occupies your mind before you go to sleep and again when you wake up; one you think about when you play with your kids, ski down a mountain, sail a boat or do any other activity that brings you great joy and pleasure. Because, lurking in the back of your mind is the mother guilt that says, "I owe you one for experiencing this pleasure, for accomplishing this task, for being free of disease, for raising healthy kids."

May you be driven through life by this compulsion. It is the price you pay for what you have been given. Although it will allow you no peace, it will, however, bring you great joy, not only for the sense of accomplishment, but for the heat of the chase.

We expect great things from you and know that you will solve problems that have defeated our generation; you will make dents in the solution of the social ills that have befallen us. I have great faith that you will not let them destroy us. But that will only come from complete dedication of mind, soul and body. And out of that will come the unsurpassed joy of the chase and the rare nirvana of the solution.

Paradoxically, it is incredible that when medicine is simultaneously held in such suspicion and is near subjugation to onerous controls, applications to medical school are at an all-time high. Some say that this is a reflection of a poor economy. It is more probably an affirmation of why we all went to medical school in the first place: that is, to help humanity and to participate in the peaceful solution of socioeconomic problems. Hopefully, society will allow us to participate in these changes.

It seems now that we are considered undeserving of that right, and maybe we have earned that status. I hope you will change that. And, I hope, we have not made it impossible for you to do so. Administrators, politicians and insurers must consider us capable of change or self-enforcement.

There are a number of motivations for pursuing research in medicine. May I propose that it is not our choice or our right, rather that it is our duty to make such pursuits a part of our everyday professional life. Each who receives a medical education at Harvard and MIT is privileged, and thus proportionately more responsible to shepherd the future.

Your additional obligation is to perform this by providing an environment in which doctors around you can succeed. Your success should be measured by their success. In the process, you must not take advantage of another individual to succeed, be it wife or husband, children, staff or colleagues. A successful career built upon the backs of family, colleagues or staff is, in essence, a meaningless one.

The revolution afforded by the techniques of molecular biology and the unfolding of the human genome bring new dimensions to diagnosis and the etiology of pathophysiology and hold the promise of bold and novel therapies based on precise knowledge of both molecular structure and function. Knowledge of the natural history of disease that comes from direct hands-on care of patients, blended with scientific disciplines, together will serve to determine the optimum time and method of these novel interventions.

As the mysteries of neurofibromatosis, amyotropic lateral sclerosis, muscular dystrophy, cystic fibrosis and steroid suppressible hypertension unfold, they will soon be followed by deeper understanding of multifactorial diseases such as hypertension, cancer and Alzheimer's disease.

The gears will be greased to confront new viruses and bacteria, new environmental stresses with rapid molecular analyses of offending organisms and pathways of destruction. From these we can design protective defenses or effective treatment paradigms that avoid or forestall destruction consequences.

Remember that your first and evolutionary responsibilities are to your current and future families, but you all have resources of energy that leave much with which to pay back society. Pay back you must. And you must learn to do it without being labeled feminists, part-time environmentalists, radicals, liberals or ultra right-wing, but as thoughtful professionals charged by society to make the right decisions.

The challenges are formidable, the consequences are profound. Compensation will be less, but the satisfaction, the mythological siren that first attracted us to this mighty profession, remains high. Settle in, relax, enjoy your exquisite gifts, build your confidence and give back with a fierce compulsion in an area that is right for you. This is the legacy of Soma Weiss and the charge established by his gracious and generous family.

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On the Periphery of Hope

by Daniel Feikin

Halfway through my fourth year at HMS, I decided to take a year off before plunging into the ocean of residency. I received a Paul Dudley White Fellowship and headed off to Kenya to study malaria at the Centers for Disease Control field station on the shores of Lake Victoria.

During the first half of 1992, while the world focused on Bosnia, the Olympics and the U.S. presidential election, news of the worsening crisis in Somalia spilled across the border into Kenya as did thousands of Somali refugees. Believing that I finally had sufficient skills to be of use in such situations, I approached the Médécins Sans Frontières (Doctors Without Borders) office in Nairobi.

I proposed a study of chloroquine resistant malaria in the refugee camps, modeled after a study I'd worked on with the CDC. After review in Paris, MSF showed great interest in such a study. So in late September I set off for a refugee camp in Liboi, Kenya, 10 miles from the Somali border.

When I returned home, America had turned its attention with great fanfare towards Somalia. While I applaud the sentiment behind Operation Restore Hope, my time in the camp makes me think that the wounds of the Somali nation will take much more than a short-sighted, limited mission to heal. What follows are some entries from the journal I kept while in Liboi.

September 23

What am I doing here? I went to the MSF Nairobi office early this morning. For two hours the French staff hustled about being very French and ignoring me. I sat there feeling uncomfortable—no French, too much luggage and not sure of my purpose. There were eight of us in a small plane piloted by a British colonial type. We quickly flew from the green slopes of Mt. Kenya into the arid, red plateau east of Nairobi. Outside the window, I saw no signs of human habitation for about an hour and a half. Then the pilot threw the plane into a sharp turn and there below us was the refugee camp.

It was striking—small, multi-colored domes sprawled across the desert floor. I could see a strip of sand bisecting the camp. It crawled with people and animals. We came down hard and the people started to scatter, but not fast enough. Just when I thought we were going to mow down a few of them, the plane quickly gained altitude again. A French nurse leaned over and told me that the first pass was just to clear off the runway.

We circled out and flew low over a troop of camels, then came down on the now empty airstrip. Stepping out of the plane, the heat hit me like a wave. I squinted at the crowd of desert people encircling us. Two white trucks streaming MSF banners pulled up and we were greeted with a flurry of cheek-to-cheek-to-cheek French embraces. Then the Somali kids broke into a loud, repetitive chant that I couldn't understand. I had entered a separate world.

September 24

A frustrating day. Claudia, the Swiss physician in charge here, gave me a hurried orientation of the sticks-and-tents hospital and then left me on my own. Eager to define my role here, I started right in on the project. I did a few practice blood smears on febrile kids from the feeding center. But under the microscope, the smears all looked like small bomb explosions. I don't know what's wrong. The malaria stain here is Field's stain, which I've never used—we always used Giemsa stain with the CDC. Maybe it's the microscope, an old clunker with an oil objective lens that looks like it met up with a teething puppy.

I've recruited a solid pair of technician/interpreters to help me out.

They're two teenage Somalis who speak a little English—Abdul Qaddir and Saddam, who told me his name and said with a smile, "I think you've heard of it before." They both remember the exact moment when they heard their first gunshots in Mogadishu, just like Americans remember their whereabouts when JFK was assassinated.

I haven't figured out what I can and can't do here. I carry a walkie-talkie around with me and all I know is that if I hear "May Day," I should run back to the compound as fast as I can. They've even planned where everyone will sit in the jeep in the case of an evacuation. I'm in the front passenger seat.

At 8:00 PM the curfew begins and we must be in the MSF compound and the refugees must be in the camp. The main difference between us and them is that we can leave.

September 26

I'm still looking at Rorschach drawings. A brand new microscope came. It seems like a good one, but the problem is that the mirror doesn't gather enough light under the heavy canvas tents of the hospital. I have to sit out in the poisonous sunlight with a towel over my head, peering into the microscope. I don't trust this Field's stain. The good news is that Abdul Qaddir and Saddam have already become quite proficient at taking blood smears.

Gunshots were heard in the camp last night. We dashed around the compound blowing out lanterns and cutting off the generator. Then the French team returned to the table and continued the conversation where they had left off. The dinner of spicy camel meat, rice and the ever-present red wine was consumed as if nothing had happened—except we were sitting in absolute darkness.

September 28

I need Giemsa! A new lab tech arrived today and I asked him to show me a malaria parasite stained with Field's stain. He searched for awhile and then pointed out something that looked like a piece of dust. He kept saying, "Don't you see it?" I kept saying "Sort of."

They've even planned where everyone will sit in the jeep in the case of an evacuation.

The land here has a beguiling beauty. Today the coastal winds blew in and whipped up a sandstorm. The fierce sun became a pale, emasculated sphere barely pushing through the brown sky. Refugees squatted in line waiting for their bimonthly food ration from CARE—the flowing bolts of cloth covering their bodies and heads billowed in the wind. I thought they looked somehow well adapted to the desert and its vagaries. Then the wind broke and the rain and sun came together. A rainbow stretched end-to-end across the flat desert.

October 1

Still waiting for Giemsa. Today I worked in the ER—four cots in a room with walls of sticks and a roof of plastic sheeting. I worked alongside a Kenyan medical student. The first patient of the day was a 10-year-old boy hit by gunfire as he crossed the border last night with his family. AK-47 is a cruel gun I'm told—the bullet glides in, but tears its way out. The poor kid was missing half of his right buttocks. We put him on fluids, antibiotics and painkillers, then loaded him into a UN plane headed for the nearest surgeons in Garissa. I think he'll make it.

The last patient of the day was a two-year-old boy on therapeutic feeding. One of the nurses called me to look at him and when I saw him I knew he was dehydrated: sunken eyes, dry mouth, flaccid skin hanging from protruding ribs. But he drank rehydration fluids like a fish. The 6:00 curfew had almost arrived and I was scared to put him on unsupervised IV fluids during the night. I left a plan to give oral fluids on an hourly and per diarrhea basis during the night. I doubt he'll make it.

October 2

Fresh Giemsa arrived on the plane from Nairobi this afternoon. Tomorrow we start enrolling in Health Post 6. Abdul Qaddir and Saddam are chomping at the bit to start. I hope to get about 100 patients with malaria over the next two weeks. We shall see.

The boy in therapeutic feeding died last night.

October 3

What a fiasco! Today I saw the claws and fangs of self-preservation that have allowed these refugees to survive. We arrived in Health Post 6 and set up our equipment. No sooner had we done this when a horde of refugees rushed me, seeing what they perceived to be a foreign doctor. They besieged me with every complaint imaginable. Abdul Qaddir and Saddam drove them back valiantly, telling them we were only interested in malaria and those with all other problems should see the Somali nurse as usual. But then they all claimed to have malaria.

We did manage to find 15 people with fever. It actually felt like a relief to go back and sit in the oppressive sun to look at the blood smears and let Abdul Qaddir and Saddam hold the crowd at bay. I found no malaria, but was encouraged by the quality of the staining.

October 5

Thirty-seven blood smears and still no malaria. I've even double-checked them at night in the compound using the electric light for illumination instead of the mirror. The smears look good but I'm starting to wonder about the stain. Tomorrow we go to the outpatient tent—maybe Health Post 6 just

covers the non-malarious part of the camp. I wrote a letter to Peter at the CDC asking him to send me some unstained blood smears from the malaria-belt around Lake Victoria. I'll stain them with the same Giemsa and see if it works.

I'm convinced that not all of the sweat on the faces of the workers here is due to the heat—part is the stress of being here. This morning a report came in that 20 armed bandits had gathered at the border and planned to enter the camp to hijack the MSF ambulance. The previous ambulance was stolen two months ago in broad daylight. Everyone grabbed their walkie-talkies and, with only a trace of extra hesitation in their steps, headed out to do their jobs.

October 15

I hit bottom. I hate the days here. By 8:00 AM the sweat has started to run and the desert light lashes out like a snake tongue. I walk the half-mile extent of my world here from the compound to the hospital. Refugees mob me demanding this or that—someone's foot hurts; can I get this one a visa to the United States; that one wants some shillings to buy khat, a nasty plant the Somali men chew for its supposed stimulant properties. I don't understand Somalis. They are somehow poised, elegant and smart, but they're a warrior people. Even the women—so beautiful, they could wrap themselves in a roll of toilet paper and look chic—but they fight like cats, pouring boiling water on each other.

The boys play mock warfare, flinging mudballs on the end of sticks at each other and us. Last night there was another volley of gunshots in the camp. Mudball boys grown up. It sounded like the pop of toy guns, but the flailed body in the morgue this morning proved otherwise.

October 17

I'm back in the ER. I'm only taking smears now from febrile patients coming to the ER who crossed from the border in the last day. Clan fighting broke out in Bardera a few days ago and the stream of refugees crossing the border, which had slowed, picked up again—about 1,000 a day are crossing at Liboi. A UN worker screens them at the border. Those in a family who seem very sick stay in the Liboi transit camp. Otherwise they're trucked straight to Ifo, a pair of refugee camps 30 km inside Kenya, which haven't yet reached their capacity of 50,000, like Liboi. Mainly Bantus are crossing now—originally brought to Somalia as slaves from Tanzania 100 years ago.

The boys play mock warfare, flinging mudballs on the end of sticks at each other and us.

The children are such a sorry lot. They look like little frogs, sitting unhappily with their stick-like arms and big Buddha bellies, snot and pus draining from their noses and conjunctival eyes. Most I send straight away to therapeutic feeding, which takes kids less than 70 percent weight-for-height and tries to pork them up with a milk, oil and sugar mixture given in eight daily feeds.

I'm waiting for my slides from the Lake Basin.

October 23

There are mosquitoes here. My bitten arms are first-hand proof. But I've never seen an anopheles mosquito, so I decided to take Abdul Qaddir and Saddam around the camp on a mosquito hunt. We all had flashlights and I drew them pictures of the way anopheles sit jacked up on the wall at 45 degree angles like hotrods. We crawled around inside makeshift domed houses for about three hours. The walls were full of things like dirty diapers, khat and crumbled shillings, but we only found eight mosquitoes—all non-anopheles.

On my tour of the camp, I made two polar observations about life here. One was that life goes on. All the photographers come here to shoot skeleton children and tragedy. But these refugees—some have been here for over a year—have created a new soci-

ety in the best way they can.

We went to the market—a huge lively place where refugees buy and sell everything from clothes to drugs, including things like chloroquine and valium. We went to a school where ambitious Somali children are taught math, English and Arabic by Somali teachers. One aggressive tyke, called by his teacher to show me his stuff, stood up, folded his hands behind his back, and barked at me, "First and foremost, what is your name?"

The other thing I observed was anger. I was trying to take a photo of a string of people with jerrycans waiting in line at a water pump. An elderly man with glasses came forward and in broken English protested about my taking the picture. He said he was a university professor in Mogadishu. Now he felt humiliated—he could not get a job with any of the nongovernmental organizations; nobody treated him with respect; and all Westerners did was come and take photos of his misery. I felt attacked and defensive, yet suddenly overwhelmingly sad about what had happened to these people.

Still no slides from Peter.

October 26

Nairobi. I left Liboi today. I was happy to go but I felt something swell in my throat as I watched the camels and blue plastic huts get smaller outside the plane window. The camp said good-bye to me in royal fashion last night. They threw a party for me, and we danced in the sand to French, Somali and American music.

Late at night, I took my mattress on top of the tool shed to watch my last desert sky. I was just dozing off when I heard the popping of gunfire in the camp. My adrenaline kicked in and I leapt up and flew down the ladder in my underwear. A few people were still around the fire. When they saw me they started laughing. André, a French Canadian worker for CARE, said "Here comes the American cowboy." I figure this was just their way of saying goodbye.

Seventy-two bloodstains, 72 negatives. No slides from Peter ever came. I talked with Claudia and told her I'd try to get some positive slides in Nairobi. I took some of the Giemsa stain with me.

October 27

I found the slides Peter sent in the CDC office in Nairobi. I took them back in the lab and stained them. Outside the window, thick trees draped in moss covered the mountains. Liboi already feels so far away.

I knew these slides were from malarious patients and if my stain didn't show parasites, then the slides I did in Liboi were unreliable junk. My stomach had that nervous, dropped away feeling. But when I looked at the first slide, it was resoundingly positive. Blue chromatin dots and red cytoplasmic rings littered the field. All the slides were positive, eight for eight. The stain worked.

I wrapped them up and sent them off to Claudia with a note. I'm not sure what she'll do with these results, but I feel this is a small victory for me and for the refugees. Of the myriad evils that plague the Somali refugees of Liboi, I feel convinced that malaria is not one.

Daniel Feikin '93 is doing a residency in internal medicine at UCSF, and is interested in a career in infectious disease epidemiology.

Heart Failure

by Amy Lai '93

When you say it's chest pain, what
you mean is sensation,
the will to feel;
what you say is, age,
panic, heat, pressure;
what you see are faces, feet that amble,
ceilings in plastic and cork;
what you show are laws of inertia;
you point with a mime's force to your
breast,
here, the flux, the turbulence,
the surge of fluid, the leak
of acid into the blood, from limb
to limb to apex.

What I mean is—words,
the lack of words,
the diaphragm in a noose,
a gazelle in a ritual
of chase, light
against dark,
noon
speed
grass
what I mean is:
coda:
dyspneic, brimming, late.

Moonflower Wine

by George S. Bascom

YOU MIGHT OR MIGHT NOT HAVE HEARD OF DEEP CREEK and some of the remarkable discoveries and inventions we can claim. Like the Feedmaster. Like moonflower wine. I can trace them right back to the original ideas. High scientists in Washington claim they discovered that moonflower wine is up there with locoweed and LSD. But it was Leonard, just down the road, who picked the moonflowers and found out how potent they were. I pieced the story together from a number of folks on Deep Creek, including Joel and Amos, two of our best farmers and neighbors. No, the people in Washington got moonflower purely secondhand. It was Leonard's find.

Now the Feedmaster idea was Joel and Amos's. Those brothers are as ordinary as a pair of old socks. But they get ideas that ordinary folks wouldn't think of, especially when it comes to helping people. I guess you could say Deep Creek is a breeding ground for inspiration.

But to get back to Leonard, he's a nervous bachelor, skinny and half bald. That is, he used to be awful nervous. In grade school he jumped if you said "Boo!" and froze if he had to recite. He never trusted a swing after one busted on him in first grade—or a rocking chair, either, for that matter. Ferd Kornbeck brought a blue racer to fourth grade, and it got into Leonard's desk. It just about scared him to death when he reached in for crayons and pulled out the snake. After that he was terrified of snakes. And he never pulled out his crayons without looking first.

Everybody on Deep Creek knew about those things and

Illustrations by Manuel King

understood them. It wasn't a problem. Leonard went into farming with a sideline in hauling and salvage work. The Jones twins, Fearsome and Cheersome, helped him. They did any climbing he needed because if Leonard got two rungs up a ladder, they had to pry his hands loose to get him down.

Then came along the Deep Creek Home Demonstration Unit with a program called "Mental Illness in Your Farm Community." The women brought cookies and lemonade and heard an extension specialist talk about how mental illness was everywhere, even in Deep Creek, if they just would open their eyes and look around. She told about a lady in a community like theirs who was afraid to go outdoors until she had a treatment called therapy. She took one little step at a time until she was cured: first she touched the doorknob, then opened the door, then stepped on the front porch, the steps, the sidewalk, and the street. Now she goes clear to Wal-Mart.

Over refreshments, Mrs. Offut mentioned Leonard. She said everybody knew he couldn't get up on a roof or face a snake and wasn't that mental illness?

Mrs. Kornbeck disagreed. "That's just Leonard. He's been that way all his life. It's only nerves."

But the extension specialist seemed pleased. She said it was mental illness just like the lady who couldn't go outdoors.

The women were all excited. To think they had mental illness among them! Everyone had an idea about what to do, including the extension specialist who kept saying something about getting him to a mental health center. She was pretty well drowned out by talk about positive thinking, zinc, vitamins, seaweed, meditation and long walks. One lady reported that her nutrition magazine said to avoid sugar, fat, starch and protein, and a lively argument broke out between a member who believed in pyramids and another who swore by her copper bracelet. Everyone there had a relative who was cured of something.

It was all Joel's wife, Jael, could talk about that evening. When Joel tried to hide behind the *Manhattan Mercury*, Jael pulled the paper aside and asked if he had any feeling at all for Leonard.

Joel said of course he did. Hadn't they been neighbors and gone to school together? Didn't Amos and he drive past his place every morning with feed?

"Well, then," Jael said, "why aren't you and Amos helping him get over his mental illness? He has it, you know."

"Now Jael," Joel said, "Leonard is afraid of snakes and getting up on a ladder or taking an airplane ride, but gracious, he isn't sick."

"That's all you know. That's what mental illness is. The specialist said so. We've been standing around and not doing a lick to help."

Joel squirmed. She had him there. Amos and he sailed past Leonard's house on the way to pasture every morning and never gave a thought to his attitudes about snakes and ladders.

Leonard's mental illness worried Jael and Martha, Amos's good wife, so much they sent a card:

When life is looking very strange
And you are scared and blue,
Just sit down with a neighbor
Or friend to see you through,
And you will find the sunshine
Although the clouds are low
For mental illness will not stay
If you say it must go.

Beneath the verse they wrote, "Here is a little something to help you over your mental illness. Your friends on Deep Creek, Jael and Martha." The little something was a hot, deep-dish apple pie.

Leonard was startled to hear he had mental illness and not altogether happy. He had always been half proud of his nervousness. It made him stand out a little from the crowd. But nobody had ever said he was sick.

He called around and heard about the HDU meeting. Mrs. Offut said everybody there was talking about him. That and the apple pie made him feel a good deal better.

When Martha called the next morning to see if the pie helped, Leonard said it did for a little while. That encouraged Martha and Jael. They started sending meals and treats over to him pretty regularly. In fact, the more they worried about Leonard, the less they did about Joel and Amos. Apple pies and ginger snaps and chocolate cakes got whisked out from under their noses and boxed up for delivery down the road.

Apple pies and ginger snaps and chocolate cakes got whisked out from under their noses and boxed up for delivery down the road.

Leonard seemed to brighten with this attention. At the same time his nervousness got more dramatic. When folks stopped by to see how he was, he looked solemn and told them "sometimes better, sometimes worse." Then he'd have a shaking fit or jump a little to show them how bad it was. Planes always stirred him up. He couldn't stand to think of anyone being that far off the ground.

Delivering food would have been even more of an inconvenience to Joel and Amos if their daily trip didn't take them right by Leonard's place. This way they could drop off whatever

morale builder their wives had fixed before hitting the plank bridge over Deep Creek. They loved that bridge, loved the way it rumbled when they hit it with a load of feed. They'd pick up speed on the approach and thunder across, enjoying the echoes after they passed and then picking up whatever stray bales fell off.

Still it spoiled half the fun because stopping at Leonard's wiped out their momentum. And besides, Leonard was never up. Now his mental illness kept him from sleeping nights. So he put on earmuffs and a blindfold around daybreak and went to bed. Leonard and the Jones twins disagreed about the cause of his sleep problems. Leonard said it was nerves, pure and simple. The Jones boys said it was TV movies and elderberry wine. Leonard told them it was ignorance about mental illness that made them talk that way. They should thank their lucky stars they didn't have to suffer from it the way he did.

Leonard's suffering was spreading into their own lives in ways they didn't much care for, especially at dessert time.

Cheersome looked at the chocolate cake Leonard was working on and said it looked like there was a bright side to it, too.

"No there ain't," Leonard said. "It's pure hell." He had a little trouble talking with his mouth full.

It wasn't long before Leonard waved Joel and Amos to a stop one bright, cold morning as they came back across the bridge from the pasture. He was in galoshes. A nightshirt hung out below his overcoat, and his head was wrapped in a scarf.

"Boys, I ain't had a wink of sleep for a week. The way you hit that bridge nearly throws me out of bed. When I lie down to rest, I can't think of anything else. I know you're coming. Sooner or later I know you'll hit that bridge. My nerves can't stand it no more. I have a mental illness, you know."

Amos shifted his hat. "Gee, Leonard, we got to get feed to those cows. This is the only way unless we go clear to Pillsbury Crossing."

"I know, but I'm close to a breakdown. I got to have some rest."

A crow cawed and Leonard ducked and danced around in a circle. "You see?" he said. "You see?"

Well, he did look kind of pitiful dressed that way and sleepy, so they agreed to stay off the bridge. Joel asked if he found the peach pie they brought over that morning. Leonard said he did, but he was so nervous and tired he hardly noticed how it tasted before it was gone. He handed them the pie plate, and Amos threw the John Deere into gear and roared off.

They talked this over on the way home. Pillsbury Crossing was a long way around. There ought to be a way to get feed across the creek without all that travel.

"Pitch it," Joel yelled over the roar of the tractor.

"Like a slingshot," Amos agreed.

That's how the Feedmaster was born. They started making drawings neither Jael or Martha could understand. Terms like "spring loading" and "ratchets" popped up in their talk. They left on sudden trips to Leonard's salvage yard. Sometimes they ignored chicken pot pie or a second cup of coffee.

This nervousness of Leonard's was causing a lot of trouble. Martha and Jael were loading Leonard up on wonderful food, the kind of food Joel and Amos liked best, and Leonard just seemed to get worse. Martha was upset. She couldn't remember when baked goods hadn't worked.

"Amos," she declared. "You and Joel have to help him. He has a mental illness. Do what the lady said at the HDU meeting. Help him out of his mental illness step by step."

Joel and Amos tried to explain they were doing all they could. They pointed out it was a lot of trouble to haul feed clear around by way of Pillsbury just so Leonard could watch TV all night and sleep all morning. Also, it was taking all their spare time figuring how to get hay across the creek. And last, they didn't know the first thing about mental illness. Hadn't the extension lady said he ought to see a doctor?

The ladies wouldn't budge. Doctor or no doctor, it was up to neighbors to help, too. And that meant Joel and Amos.

"You have to help him out of it little by little. Start with snakes and airplanes. You can do that much. The poor man needs help. We should be ashamed to have mental illness on Deep Creek."

Well, Joel and Amos talked about it as they looked for parts in Leonard's salvage yard. Leonard stayed indoors, but Cheersome and Fearsome Jones were a big help. They aren't big, under five feet and 100 pounds each, but they know work and they know the salvage yard.

When Joel asked where Leonard was, Cheersome said, "In the house. Making wine. Nerves he says."

Fearsome chipped in. "Makes wine all the time now. Dandelion, cherry, elderberry, plum, wisteria, spirea. Now he's brewing moonflower. Never heard of moonflower wine."

"Don't sleep at night no more," Cheersome went on. "Says he has a metal illness."

"Mental," Amos said.

"Says his bed's too high. Won't sleep on the floor, either. Says he's scared of snakes."

"Always was scared of snakes," Fearsome said, "but not like this."

The twins looked at one another and spoke as one. "Man needs help," they said.

That was enough for Joel and Amos. Leonard's suffering was spreading into their own lives in ways they didn't much care for, especially at dessert time. It was time to take hold. They told the Jones boys they'd tackle this mental illness.

With Leonard off their minds, the Jones boys turned to the Feedmaster project. Scurrying around in the salvage yard, they located heavy leaf springs, an axle and wheels from a Mack truck, some I-beams, bolts, and a handsome ratchet arrangement. Fearsome asked them if they could use a bungee cord, but Amos told him to set it aside. Just then they wanted to see how leaf springs would work.

For the twenty-first time Amos heard from Martha how the lady who didn't dare stick her head out the door was cured.

Once they had the parts, Joel and Amos disappeared into the big implement shed. They came out for chores and meals but forgot a good many other things, like errands to town. Jael minced no words. She wanted to know what was so all-fired important.

Joel explained that the Feedmaster would save them long trips to the pasture. It would give them time to work on Leonard's mental illness and help with errands. He told her they needed a couple more days.

Jael wasn't happy. She had the feeling Joel and Amos were wasting time on a wild goose chase. Leonard needed help right now. The whole community was worried.

There wasn't much sleeping done the next two nights. It was a weary pair that wheeled the Feedmaster out of the shed. It was curious looking and folded up on itself. They ran the Feedmaster down to a clearing by Deep Creek that offered privacy and plenty of room. A steep, grassy bluff rose beyond low timber on the other side of the creek. When they heard the clatter, cows came to the brow of the hill hoping for feed. Most stayed on out of curiosity as Joel and Amos unlimbered the Feedmaster. When it was unfolded and locked into place, the Feedmaster looked like—well, it looked like a big slingshot.

Joel heaved an 80-pound alfalfa bale into the netting. Amos levered the ratchet until the springs groaned. Then he jerked the trip rope. The Feedmaster fired a tumbling bale on a line drive through the timber into the hillside 50 yards away. Twigs and small branches rained down along its path. A surprised crow couldn't decide whether to get off his branch or ride it down. Just before it hit he dropped off with a caw and flew away, heading for cover. When the bale exploded among them, cattle on the hillside scattered at a run. Joel and Amos pounded one another on the back.

"It works," they yelled. "It works."

The next bale flushed a covey of quail and a jackrabbit. Then, to clear the timber, they changed elevation and found they could reach the crest of the hill. By then, a good deal of prime alfalfa was scattered on the hillside, but the cattle were skittish about taking a bite. Joel and Amos figured it was just a matter of getting used to the new delivery system.

They hadn't tried a salt block yet, and Amos was anxious to load one in. It was quite a surprise and, yes, something of a worry, too, when the salt block cleared the hill with plenty of room to spare. It was still climbing as it passed out of sight. With that they agreed it was time to close down.

The Mercury headlines next day read, "FALLING OBJECT NARROWLY MISSES ROAD CREW." The paper went on to say a 12-inch cube of unidentified material plummeted into the midst of a Riley County crew that was on break. Authorities assume it was released from a high flying aircraft. Before burying itself in the ground, it destroyed a large coffee thermos, two dozen Carol Lee doughnuts and a clip board. The demoralized crew was now taking coffee break under an asphalt truck.

When Jael read the item, Joel let it pass without comment. Yes, the object could be a salt block. And, yes, they fired one in that general direction. But if the RCPD said it fell out of an airplane, that was good enough for him.

Joel and Amos had little time to enjoy the success of the Feedmaster. Next morning their wives found Leonard standing in the middle of the road, stiff as a stick. It didn't help they were delivering a peach pie and then going after groceries the men forgot to pick up. Martha pulled up alongside and asked Leonard why he didn't move out of the way.

"Nerves," he said. "Airplane."

Martha got out and took his arm. "Did it swoop too low, Leonard?"

"No," he whispered. "Too high. My nerves are awful this morning." He glanced in the back seat and calmed down a little. "Is that a peach pie?" he asked.

The women coaxed him back in the house and called the Jones boys, who were stacking bathtubs out back. Jael scolded them for leaving Leonard alone that way. Fearsome sighed and said they were sorry, but they thought the elderberry would hold him. Martha fixed coffee and a slab of pie. Leonard shook but managed to eat the whole pie and drink two cups of coffee before they left.

Jael and Martha headed for home and called a meeting with Joel and Amos. "He needs help, and it's high time you

two stopped this Feedmaster business and got busy." Martha nodded.

The men said they had the feed problem licked, and it was going to give them some extra time to help Leonard. They weren't quite sure how to go about it, but by heck they were ready to try. For the twenty-first time Amos heard from Martha how the lady who didn't dare stick her head out the door was cured. But Jael and Martha had their arms crossed and a look on their faces that made the men both act like it was the first time they heard it.

"I know you boys mean well," Leonard whined, "but getting over mental illness is awful hard on the nerves."

They agreed to visit Leonard that day, right after feeding the cows. True to their word, after lofting several bales across Deep Creek, they dropped in on their neighbor and told him he was about to be cured. Leonard backed away and crouched behind a chair.

"What do you mean 'cured'?"

"Able to handle snakes," Amos said.

"Able to climb a ladder and fly an airplane," added Joel.

Leonard turned pale. "Snakes! Airplanes! Are you crazy?" His voice got shrill.

"Not all at once," Joel said. "Little by little. We'll ease you along, won't we Amos?"

"It's called therapy," Amos explained.

"Not me. I been this way since grade school. I can't even think about them things. Besides I got a mental illness now." He was shaking and started for the kitchen.

Joel grabbed him. "It's all right, Leonard. One tiny, easy step at a time."

"Starting now," Amos said. He fished the picture of an airplane out of his pocket and shoved it under Leonard's nose.

"Get it away," Leonard yelled and struggled in Joel's grip.

Amos put that picture away and reached into another pocket.

"Here's your snake," he said and waved the picture of the boa constrictor in front of him. Leonard broke away and jumped on a chair.

Amos put the picture away and helped him down. Leonard said the treatment nearly shattered his nerves. But he recovered enough to ask if Jael or Martha forgot to bake something for him. Amos said it was cookies, and he just forgot to bring them in. They promised to be back tomorrow.

For a while they had to coax Leonard out from behind the door with baked goods for his treatments. Pictures were so hard on him that they had to start with words. When he could stand words, Amos hauled out pictures again, outside the house at first, then inside behind Leonard's back, off to one side, and finally face to face. Leonard still shook but maintained a hearty appetite.

It was slow, but Fearsome and Cheersome said his nervous fits were easing up and he was sure putting on weight. Now that he was gentled to pictures, Amos announced the next step would be the real thing, a real airplane and a real snake.

Cheersome brightened. "Got 'em both," he said. He showed them a wrecked glider in the salvage yard. Luckily a tame old bull snake lived in the nose. When Leonard was ready, the glider and bull snake would be ready, too.

As everyone was learning, therapy for mental illness is slow work even with the steady prodding of Joel and Amos and the daily baking of their wives. By the time Leonard could stand the picture of a snake, field work was coming on and the pasture greening up. The Feedmaster took a back seat until a rainy spell gave them time to try a bigger load. They hoisted a round 1,600-pound bale on the ramp and ratcheted back to full power. When they fired it, the Feedmaster barely shoved the bale off the ramp.

"There's no zing to it," Amos said. "No zing at all."

It was a comedown all right. Even the Feedmaster seemed ashamed. Here they had been sailing square bales and salt blocks all over the near countryside but couldn't heave a round bale over a barbwire fence.

They talked about ways to power up. Compressed air, steam, rockets all seemed too complicated. Then they remembered the bungee cord. They could tie that into the leaf springs. They hurried back to the salvage yard, hoping somebody hadn't already snatched it up. While they were coiling it in the back of the truck, Leonard came by to say hello and check for pastries.

Joel told him they thought he was ready for the next step in his cure. They'd looked at pictures enough. It was time for the real thing, a real plane and a real snake.

"I know you boys mean well," Leonard whined, "but getting over mental illness is awful hard on the nerves. What if I got snagged on an airplane and it takes off? What if a snake comes after me?"

Amos shook him. "Leonard, we're talking about that wrecked glider out back. It can't fly, and anyway you'll be used to it before you get in."

"Get in?" he moaned. "I forgot about that glider. I want it off the place."

They reminded him it only had one wing, but that made no difference. So Joel and Amos agreed to take it to their place. They could work on Leonard's mental illness over there just as well, and it would save them delivering baked goods every day. Leonard could pick them up himself.

Leonard disappeared into his house and pulled the blinds

while Joel and Amos carried the glider past his house to the truck where the bungee cord was already coiled. When the loose wing was loaded, it was past dark.

As soon as they could spare a minute, they reattached the wing. It was a simple matter of two-by-fours and a few nails. The fabric was a little tattered but an old tablecloth and some thumb tacks fixed that. In other odd moments they wove the bungee cord between the leaf springs on the Feedmaster and lengthened the ratchet 15 feet.

Leonard sat there as long as Joel's hand was on his shoulder and Amos held his belt.

Day by day they worked Leonard closer to the glider. First they had to blindfold him. Later he faced it open-eyed. But about 10 feet from the glider he balked. Stopped dead in his tracks.

"What if I'm in it and a tornado comes up? Will that thing fly?

They had to admit they hadn't thought of a tornado. Joel was about to remind Leonard you don't need any help to fly in a tornado but thought better of it.

"I ain't taking chances," Leonard said. "I want a propeller and a parachute. And I ain't getting in a glider alone. I want someone with me who can fly it."

Joel and Amos had the feeling they were getting close to the bone on Leonard's mental illness. He was pushing them to the limit, but they were getting pushed at home, too. Besides that, they just didn't like to quit.

Well, they tackled the matter of pilot training with their friend Myron Rooks. Myron taught gliders in the war and when they asked to talk about it, he was as nice as could be. He explained the pedals and stick. He said the dial in the cockpit told how high you were. Sitting in his arm chair, he showed them how to turn and land. Joel and Amos moved their feet and shifted the stick along with him until they almost felt as if they were flying a real glider, too. When he went into glide ratios and drafts they stopped listening quite so hard. You don't need to know everything to sit in a busted glider.

When Myron asked why they were so interested, they said it was complicated, but they were trying to help a neighbor get over his mental illness. He was afraid of planes. Myron said a plane is safer than a car. He'd had a wonderful time flying gliders and felt safer in a glider than on the highway.

Driving home, Joel and Amos were pleased. They had expected learning to fly would be a lot harder. Next day they told Leonard he could forget that worry. If a stray tornado picked up the glider, he had a trained pilot to count on.

"What about the parachute?" he said. Joel rolled his eyes back, but next morning they drove to Fort Riley and asked at the information booth about a parachute for a glider. He had to repeat it twice before the MP went back in to make a call. He kept his eye on Joel and Amos while he talked. Soon a jeep pulled up. An officer asked again what they wanted. He told them, no, the army didn't have parachutes to loan out. They could try a surplus sale. One was coming up tomorrow.

He cleared his throat and asked why they wanted a parachute for a glider anyway. About halfway through the explanation he stopped them, saying he had to get back to the office. When he went in the booth, he put his finger to his head in some sort of military signal. The MP nodded.

Until they had a parachute, they were stalled. So they went to the surplus sale. Parachutes weren't listed but helium balloons were. They would do as well and for $85 they got six and helium tanks, too.

Back home they lashed the balloons to the glider and laid the tanks in the cockpit.

"If that don't make the glider safe, I'm strapped," Amos said.

It might have made Leonard feel a little better, but not much. He still wanted a propeller and started making noise about pontoons. They told him he had to meet them halfway. They had learned to fly for him, and they bought balloons, which were just as good as a parachute, maybe better. Gliders weren't supposed to have propellers anyway. While they talked, each of them took an arm. Leonard found himself being walked up to the glider with its balloons and helium tanks. He shuddered as they leaned him over the cockpit.

"Lighter than air, Leonard," Joel told him. "If anything lifts her off the ground, she'll float like a feather."

When they turned Leonard loose, he said, "Well, I'll climb in if one of you does first. I ain't getting in by myself."

"I'll get in," Amos sighed. "We'll have to do a little carpentry to make the cockpit big enough. When the time comes, I'll get in with you."

They knew Leonard's limits and didn't push any harder. He had touched the glider and looked into the cockpit. Tomorrow he could get in.

It wasn't a great deal of work to enlarge the cockpit. The wood was light and sawed easily. Fearsome found a nice bucket seat in a wrecked Grand Prix, and in no time the glider was up to Leonard's specs.

Next afternoon, with Amos in place and after lots of coaxing, they got Leonard into the cockpit. Joel says it was like stuffing a square peg in a round hole. When they finally got him in, Amos interrupted his fussing.

"Come on, Leonard, it's just like an easy chair in your front parlor."

Of course it wasn't exactly. They sat in a shop-worn old glider in the grass beside Deep Creek with helium tanks under their feet. The Feedmaster crouched next to them with its big new sling of woven bungee cord. And the modified cockpit had a few unclenched nails as Amos discovered when he tore his pant leg.

Amos remembers takeoff like the kick of a mule.

Leonard sat there as long as Joel's hand was on his shoulder and Amos held his belt. As soon as they turned him loose, he popped out like a jumping jack. Amos came out after him and clapped him on the back.

"Tomorrow," he said, "we'll be ready for takeoff."

"Takeoff," Leonard yelped. "What do you mean, take-off?"

"Goodness, Leonard," Joel sighed. "Ready for takeoff. Not flying. Amos will be right there behind you."

"I don't know," Leonard fussed. "I'd feel a lot better if we had a parachute on this thing." He was still carrying on when they dropped him off at his house with Jael's German chocolate cake in his hands.

Joel and Amos were to point out later that you can't run a farm, plant milo, check on calves, care for business, and treat mental illness at the same time without overlooking something. They hadn't gotten around to testing the improved Feedmaster, though they had been satisfied that the bungee cord and reset ratchet had made a difference. Another thing they didn't get around to was Leonard's snake problem.

The next day was a long one before they could get Leonard in a ready-to-take-off situation. Field work and breakdowns and chores used all there was of daylight. After supper, they lifted the glider on the Feedmaster ramp and steadied the wings with hackberry limbs. Together, they ratcheted the Feedmaster to full power, a matter that took all their muscle and popped the sweat out on them. Then, as a full moon rose into the sky, they went for Leonard.

He was surprised when they showed up. Cheersome and Fearsome say he had been nipping elderberry all day. When the sun went down, Leonard figured he was off the hook. So when Joel and Amos knocked, he darted into the wine pantry. He grabbed for the elderberry and picked up a jug of moonflower wine by mistake. It was his first drink of the new variety, but he wasn't paying any attention to taste or bouquet. He took several long pulls. Then he wiped his mouth and joined Joel and Amos on the front porch.

He did seem braver to them and talked more than usual as they drove through bright moonlight to the Feedmaster on Deep Creek. They were surprised when he put his arms around their shoulders.

"Boys," he said, "I think this here treatment is working." He hiccuped. "I been sleeping nights and I think my appetite is coming around. I ain't hardly scared of planes anymore. Hell, they ain't but big pieces of furniture. I don't know what gets into people."

Amos nodded. "A man has to trust the Lord. The Good Book says a sparrow don't fall but He knows it."

Leonard tightened up a little. "I wish't you hadn't mentioned a sparrow falling."

Joel patted his knee. "Don't you worry. You'll be home in no time."

Leonard barely remembers getting in the pickup that night. Just about this time things got real strange for him. The moon began changing colors, and he recalls fence posts dancing like a chorus line.

Even in this unusual mood Leonard wasn't easy to get in the glider. He was talking to himself pretty steady, but every now and then would come to and worry. When he whimpered about the glider falling off the ramp, they showed him how the wings were propped. Amos crawled into his bucket seat. Leonard threw one leg in and froze.

"I can't do it," he said and tried to step off. Joel braced him from below and hoisted him back.

"What if it takes off?" Leonard whimpered.

Amos grabbed his belt and pulled. "Sit down, Leonard," he said.

Leonard wailed, "What if it goes off? It could. You could forget and jerk the rope by accident."

"Oh, for heaven's sake," Joel said. "You hold the rope then."

Joel and Amos were tired from a long day's work and to tell the truth, a little tired of Leonard's mental illness, too. They were ready to get the session over with and get home, though, thanks to Leonard, all they had to look forward to was Keebler cookies. Joel stepped out to a wing tip to steady it. Leonard's fidgeting was shaking the props loose.

"Sit still a minute and take a big, deep breath," Joel said.

To their surprise he did. They heard him whisper to himself, take a few deep breaths and stretch. After a minute his voice floated out of the cockpit.

"Say, this ain't bad at all."

You have to take what Leonard remembers of the evening with a grain of salt. Evidently he noticed something squeezing his ankle and paid it no mind. Then his knee felt funny. So he pulled it up and looked right into the face of the bull snake. You have to discount his recollection that it was wearing sunglasses.

He rose out of the cockpit, yelling and shaking his leg, waving his arms like a wild man. Joel hollered to be careful of the trip rope. Of course, Leonard should have thought of it himself, but he's only human and his mind was on the bull snake.

Joel said one second he was holding the wing tip, and the next it was gone. Amos remembers takeoff like the kick of a

mule. It threw Leonard into his lap, cracked his head against the rim of the cockpit, and slid his bucket seat back into the belly of the glider. Helium canisters banged into his shins, and Leonard was all excitement. He kept rearing up and shaking his leg.

The moon was bright enough that Joel could watch the glider clear the hills and rise in a fast, wide circle. He was pretty sure they had solved the Feedmaster's power problem, and he was glad Myron Rooks had taught Amos to fly. He was glad, too, about the helium balloons because even at that distance he could make out a good deal of wobble in its flight.

Amos admits he was pretty shocked to find himself airborne. But then he remembered Myron saying he was safer flying than in a car and pulled himself together. Once he fought clear of the helium tanks and into the cockpit again, he grabbed Leonard by the belt and sat him down. He'd lost patience by then and told Leonard to cut out the jumping around. Leonard pointed at the snake on his leg, and Amos told him to forget it.

"It's only a bull snake. Sit down so we can fly this thing."

A curious calm came over Leonard. He smiled and stared affectionately into Amos's face.

"Amos," he said, "What are you doing here?"

Leonard turned his face to the moon. "Ain't it beautiful? A giant peony, and it's smiling at me." It didn't seem to bother him that the bull snake was now twined around his arm.

The Feedmaster had given the glider a fine boost, but after a while it began to lose headway. Amos said the cockpit was plenty drafty but none of the drafts were lifting the glider like Myron said. It didn't help that Leonard discovered the ground was beautiful, too. He leaned over and tried to hug the hills and lights below. He told Amos that trees were dancing and waving to him. The bull snake was off his arm now and around his neck.

"I never saw anything so beautiful. Hello trees, hello hills, hello, hello..."

Each time Leonard shifted sides so he could say hello to everything, Amos had to throw himself the other way to keep the glider upright. He couldn't see the gauge, but Amos was pretty sure they were coming down, not to mention dipping and spinning more than he liked. And he didn't care for the cracking sound in the wing, either. He wished they had used a few more nails.

In lots of ways it was nice up there. Myron was right about the quiet. Without Leonard it would have been peaceful, too. Amos would have liked to give the glider a fair chance, but decided it was better to be safe than sorry.

Amos had to wrestle the balloons out from under Leonard, inflate them and feed them out on their lines. Judging by the way the glider dropped through a fleecy little cloud, it was picking up speed, so he worked at it pretty hard.

When the third balloon popped open, they steadied. By the time the sixth one was full, they were rising again. The change of direction did it to the wing. It fell off with a crack and fluttered away. They shot up faster.

That was the situation when Frontier Airlines Flight 107 began its approach to the Manhattan Municipal Airport. Interviewed later, the captain, with 5,000 hours flight time, said their landing lights illuminated a large manned boomerang suspended from multiple spheres. Asked if he saw intelligent beings aboard, the captain hesitated.

"I did see...two beings. One waved and attempted to exit the craft. The other appeared to restrain it. Then they were gone."

He had no idea what the propulsion system was, but it was powerful and lifted the craft at a rapid rate. One reporter asked about anti-gravity. The captain shrugged and said it was possible. He emphasized he had been startled. Even now, he found it hard to believe what he saw.

The National Enquirer picked up the story a week later: SPACE ALIENS ABDUCT HUMAN GIANT BOOMERANG—Airline Pilot Narrowly Escapes Capture.

Amos says the pilot was right about one thing. Leonard did try to step off the glider onto a moonbeam. Amos pulled him back so hard he jack-knifed into the cockpit with his legs sticking out and his head in Amos's lap. The bull snake settled on Leonard's chest.

The helium balloons were all they hoped for and then some. Amos picked up altitude to where it was pretty nippy. He thought he saw Wamego, Council Grove, Junction City and Marysville. That was high enough. He didn't care about sighting Kansas City or Denver.

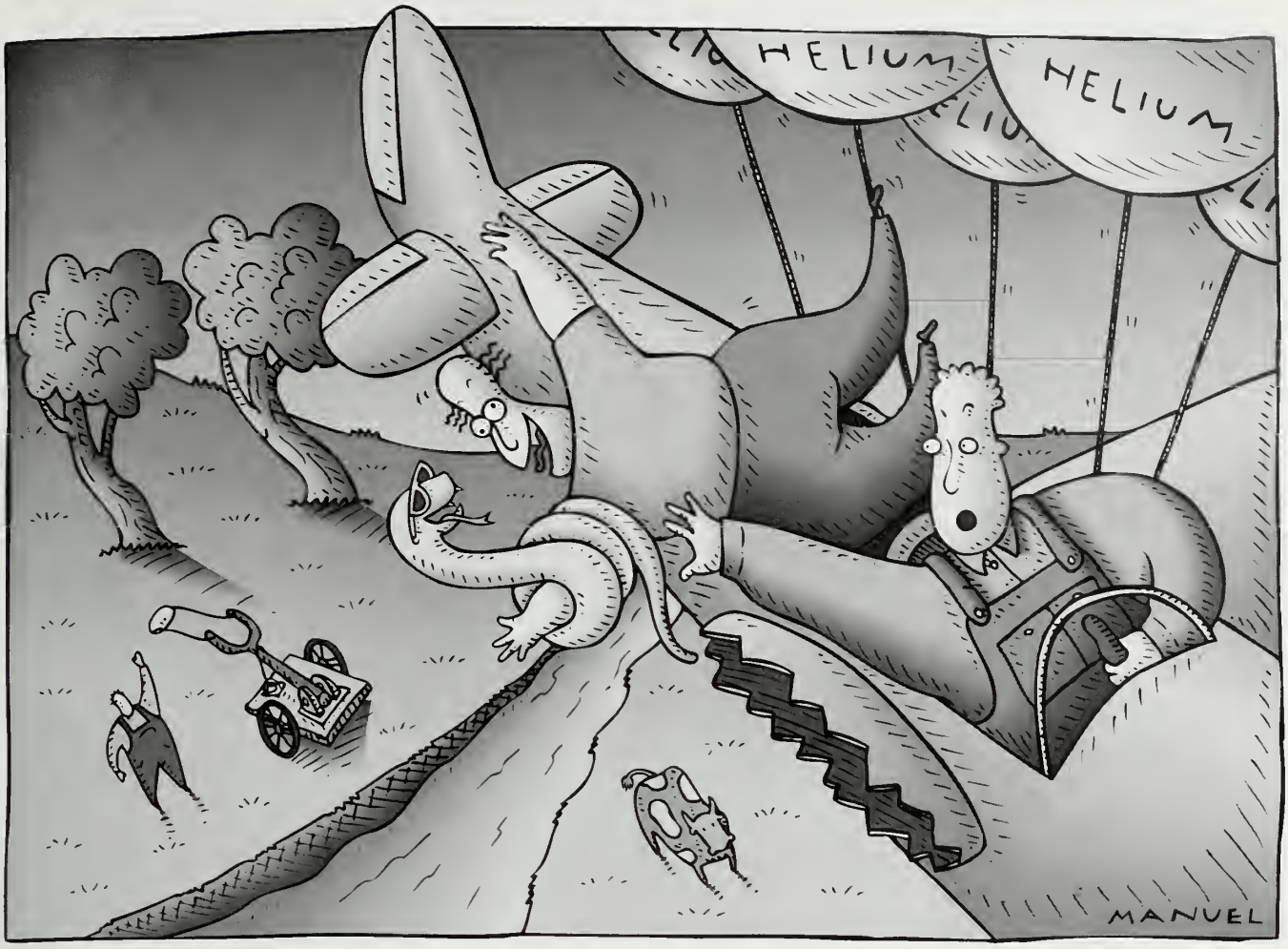
Myron Rooks hadn't covered this particular flight problem, so Amos had to improvise. Getting down meant letting helium out of the balloons. But they were tethered six feet above and hard to reach.

Leonard was dead weight by now, laughing and talking to people Amos didn't see or crooning to the bull snake on his chest. The snake reared up from time to time and shook his head.

Amos worked his way out from under Leonard and loosened a board from the stump of the broken wing. Rising in his seat, he could just reach a balloon and punched a hole in it with a nail at the end of the board. He punched a few more holes. It was hard to judge whether he was coming down or not. Finally, though, they settled into a cloud and emerged with Deep Creek below. He recognized the pickup following along far beneath them.

He told Amos that trees were dancing and waving to him.

There was little wind that night, and



the glider, or what was left of it, drifted to a landing in an alfalfa patch 50 feet off Deep Creek Road. Joel was right there with the pickup and hustled out to see how everybody was. He cut the balloons loose and helped Amos and Leonard out of the glider. Leonard gave Joel a long embarrassing hug and then mentioned to Theodore Roosevelt and Julius Caesar that the moon was dividing into little pieces. He didn't notice Joel and Amos load the glider on the pickup and didn't resist when they led him to the front seat. Amos offered to take the bull snake, but Leonard explained they were personal friends.

Back at Leonard's they roused Fearsome and Cheersome and told them they were pretty well through with the glider and wanted to return it. They said they just wanted to get Leonard checked. He wasn't acting right. The Jones boys agreed about that. Leonard was whispering secrets to a crowd of invisible people and to the snake on his shoulder. They were pleased to see him so friendly with the bull snake and more than a little surprised. When he set it down to shake hands with Babe Ruth, it disappeared like a flash into the tall weeds of the salvage yard.

Cheersome nodded. "He's addled. It's the moonflower wine. Took a sip last night myself. Lights went on. Saw things for an hour. Don't remember much. Leonard downed half a jug."

Joel and Amos felt easier. In the back of their heads was the notion the night's mental treatment might have been too much for Leonard, even though a good deal of it was Leonard's fault. Still, they took him to town. In the Emergency Room Leonard picked imaginary bouquets and gave them to the nurses. In between he pinned medals on some of the soldiers George Washington had with him. When folks began to stare, the men explained he was a little off in the head but harmless.

After he checked Leonard, the doctor told them they could go home, but Leonard would have to stay. He wasn't exactly sure what was wrong, but he was suspicious of the moonflower wine. The jug they brought in was going to a lab in Washington. When Joel asked if it could be his diet, the doctor said anything was possible.

"Poor fellow," the doctor went on, "flying to the moon with a snake, flower gardens in heaven, dancing fence posts, a glider with a friend in it miles above the earth...."

Joel and Amos, shook their heads. They agreed it was

hard to believe.

The moon was nearly down when they got home, but they had some explaining to do to their wives. They said they had unexpected problems with the Feedmaster.

"Then," Joel added, "Leonard went out of his mind tonight, started seeing the wildest things, talking to George Washington and Babe Ruth and what not. So we had to run him to the hospital."

The women were shocked and wanted to know what the doctor thought.

"Well," Joel said, "he just wasn't sure. It might have been something in the moonflower wine. Then again," he paused in deep thought, "he said it could have been his diet. Too much rich food."

Amos looked up and nodded. "The doctor wasn't sure. They're putting him on a hospital diet."

"Oh, my goodness," Martha cried. "I hope our baked goods didn't make him worse!"

Jael didn't say a word. She stared long and hard at Joel who got interested in a crack in the ceiling plaster. He broke the silence with the cheerful news that he thought Leonard's mental illness was over. He held a snake and as far as they could tell wasn't much afraid of anything. Jael kept looking at him and said she'd be interested in what Leonard had to say about all this.

They both hurried to tell her she shouldn't believe anything Leonard said about the evening. They never saw a man more addled.

He's not afraid to climb a step ladder now or watch a snake go by. Though he does miss the cakes and pies, he never admits to mental illness. Treatment is what scares him now.

When Leonard came home, everyone was pleased with the change, although he did have what the doctors call flashbacks, some in great detail, about being in a plane when a wing fell off or being flung into the air by a giant hand or dancing with snakes wrapped around his arms and legs. They are hard on him, but other flashbacks are nice—a sky full of flowers and trees dancing, star dust and moonbeams. The bad flashbacks cured him of wine.

He's not afraid to climb a step ladder now or watch a snake go by. Though he does miss the cakes and pies, he never admits to mental illness. Treatment is what scares him now.

Jael and Martha were glad to report his cure to the Home Demonstration Unit, which took full credit for it. The Jones boys, on the other hand, give credit to the moonflower wine. Joel and Amos, who have flashbacks of their own, see the hand of the Lord in all that happened.

As for the Feedmaster, it's in the back of the implement shed. Joel and Amos have the use of Leonard's bridge and aren't feeding now anyway. They still hope to improve it some more next winter. Joel says it isn't completely practical for farm work yet, though it's sure ready to do the Lord's. But Amos rubs a knot on the back of his head and looks doubtful. He is willing to wait awhile before he cocks the Feedmaster again.

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